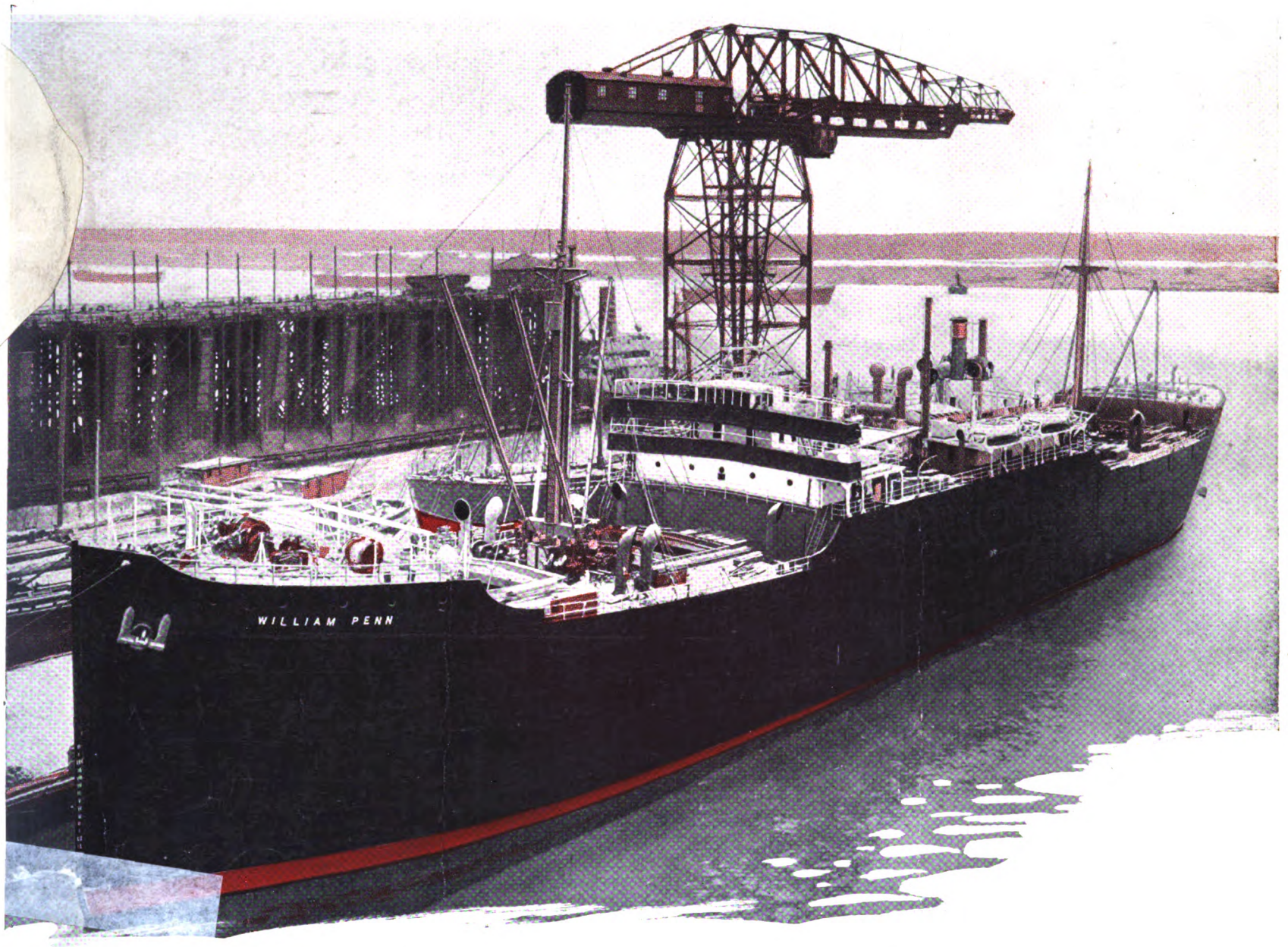

Correct Lubrication for the William Penn

THE MOTORSHIP, William Penn, is the first vessel equipped with Diesel engines to be launched by the United States Shipping Board.

The installation consists of 2 Burmeister & Wain 4 cycle 6 cylinder engines of 2250 I. H. P. When the selection of lubricants came up for decision, the recommendation of the engine builders was followed—and Gargoyle D.T.E. Oils were ordered and used.

Not only Diesel engine builders, but motorship owners and engineers the world over recognize the merits of these high-grade oils and vote almost unanimously for their use.

On its trip around the world which started September 3rd, the William Penn can promptly secure supplies of Gargoyle D. T. E. Oils, as needed, from regularly equipped service and supply stations at over 250 leading ports.

GARGOYLE

Marine Oils

A grade for each type of service

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* **NEW YORK, U.S.A.**

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McINTOSH & SEYMOUR CORPORATION

AUBURN, N. Y., U. S. A.

Have Furnished Heavy-Duty Diesel Marine Engines For the Following Ships

Name of Vessel	Dead Weight Tonnage
CETHANA	3300
ISLA DE JAVA	4100
CHALLAMBA	3300
CULBURRA	3300
COCHIN CHINA	2500
BAYONNE	1500
COOLCHA	3300
SOLITARE	5000
BENOWA	4400
BALCATTA	4400
BABINDA	4400
BOOBYALLA	4400
BORRIKA	4400
MARYLAND	4500
TEXACO No. 146	1000
TEXACO No. 147	1000
J. F. PENROSE	4500
BRAMELL POINT	5000
ASTMAHCO No. 3	3000
ASTMAHCO No. 4	3000
BAKOI	2500
CAROLYN FRANCES	1000
DONNA LANE	3300
KENNECOTT	6500

LOOK UP THESE VESSELS WHEN THEY ARE IN PORT

MAIN OFFICE AND WORKS

AUBURN, N. Y., U. S. A.

149 BROADWAY
New York City

700 INTERSTATE BLDG.
Kansas City, Mo.

815 SHELDON BLDG.
San Francisco, Calif.

412 DALLAS COUNTY STATE BANK BLDG.
Dallas, Texas

412 BISBEE BLDG.
Jacksonville, Fla.

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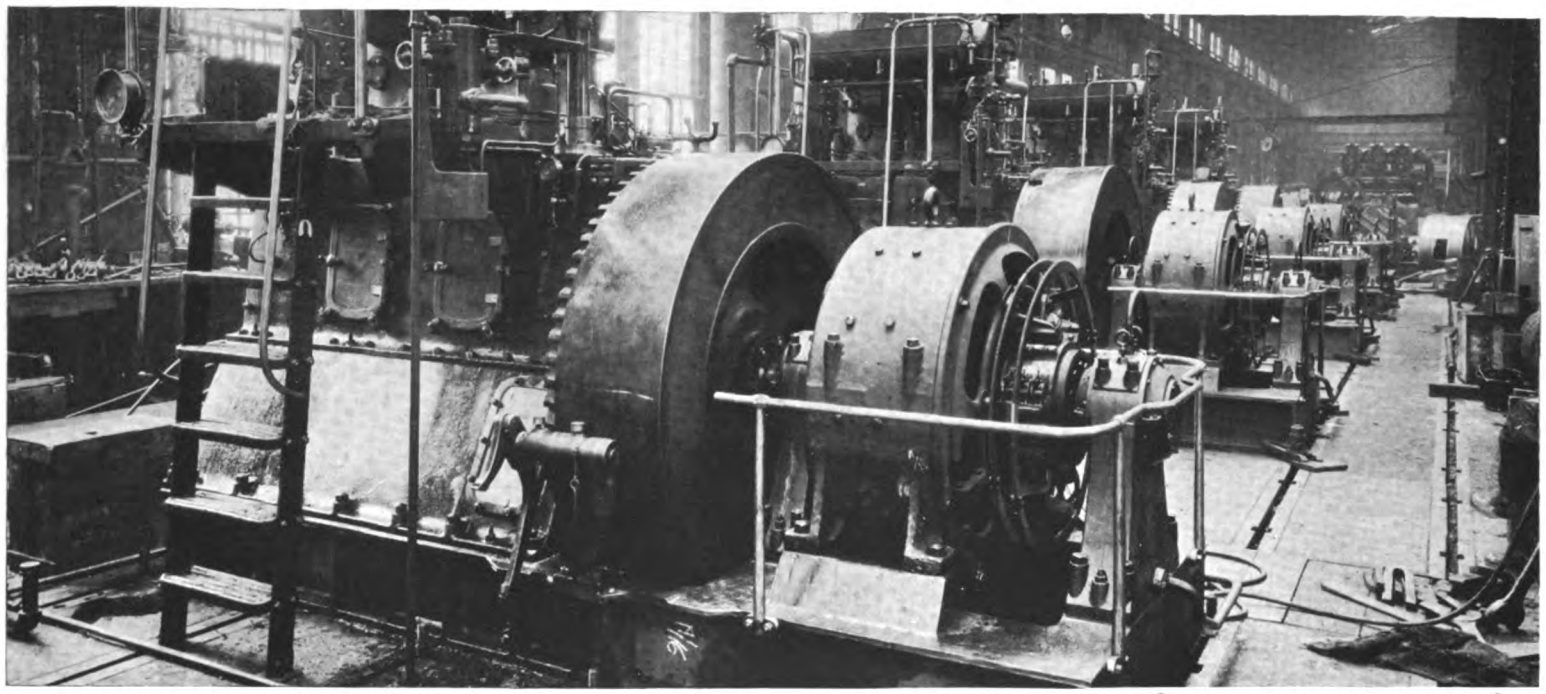

Diesel-Engine Generating Sets for Motorships

The equipment pictured above represents the generating units for the American Hawaiian S.S. Co.'s new Motorships. Each set consists of a Cramp B. & W. Engine coupled to a Diehl Electric Generator of the open Heavy-Duty Type. Diehl Generators are arranged for forced-feed lubrication.

DIEHL MFG. CO., ELIZABETH, N. J., U. S. A.

UNITED AMERICAN LINES
INCORPORATED

Managing Agents: American Hawaiian Steamship Co.
American Ship and Commerce Navigation Corporation

General Agents: Hamburg-American Line

Hamburg
Joint Services with
Hamburg-American Line
From New York, Boston, Philadelphia, Baltimore, Norfolk and New Orleans
Through bills of lading, via Hamburg, to all Baltic and Scandinavian Ports

North Africa and Levant
New York to Oran, Algiers, Tunis, Bona, Philippeville, Ceuta, Bizerta, Malta (Valetta), Alexandria, Smyrna and Beirut

Dutch East Indies
New York to Penang, Belawan-Deli, Port Swettenham, Singapore, Batavia, Samarang and Soerabaya

Intercoastal Service
With Steamers of the
American-Hawaiian S. S. Co.
New York, Boston and Philadelphia to Los Angeles, San Francisco, Portland, Seattle and Tacoma
Through bills of lading, via Los Angeles to San Diego, via San Francisco, to Oakland, Stockton, Sacramento, California; and to Honolulu, Hilo, Kahului and Port Allen, Hawaiian Islands

Pacific Coast to Europe
U. S. Pacific Coast Ports
to the
Principal Ports of the United Kingdom and Continent
Direct Fortnightly Sailings

Telephone: Whitehall 1020

General Offices: 39 BROADWAY, New York

Cable Address: "Unamline, N. Y."

Branch Office: 40 Central St., Boston | Western Freight Office: 327 So. LaSalle St., Chicago | Western Passenger Office: 156 No. LaSalle St., Chicago | Branch Office: Bourse Bldg., Philadelphia

General Pacific Coast Agents, Williams, Dimond & Co., 310 Sansome St., San Francisco

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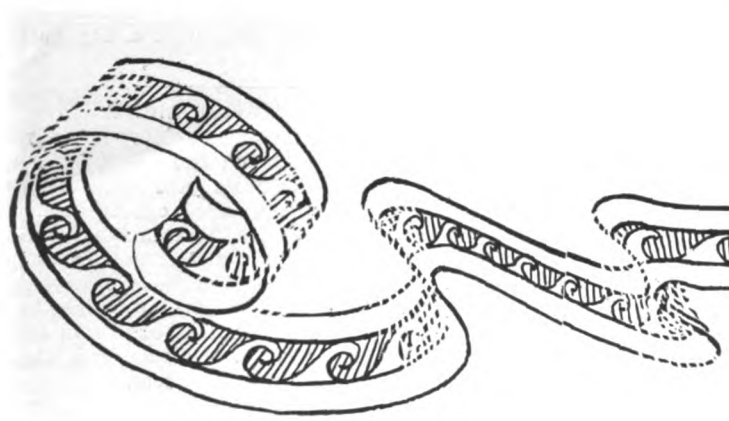


Wi

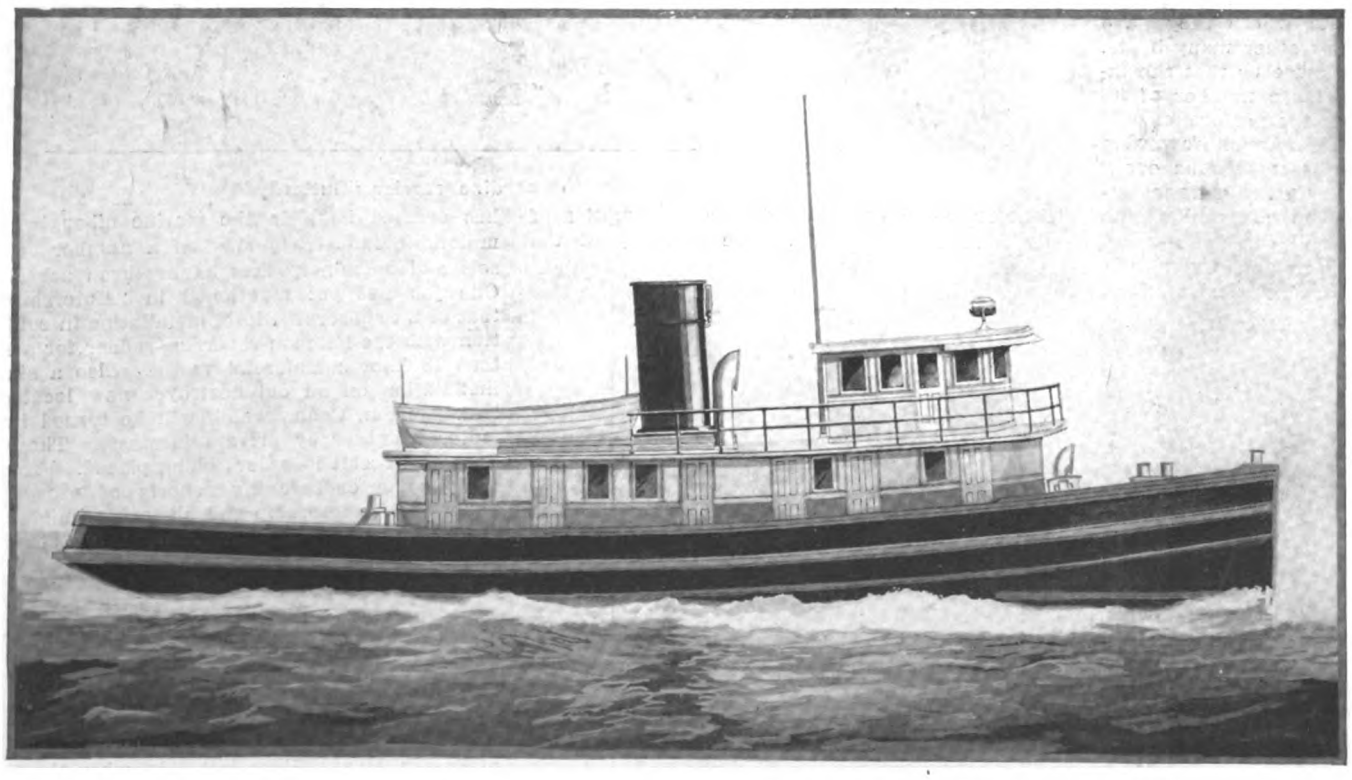
OIL DIESEL TYPE

A DIESEL DRIVEN TUG-BOAT

The Abitibi Power & Paper Co., Ltd., had a towing problem, they had to move their paper pulp logs about 25 miles up the Abitibi River in Canada and they wanted to do it as cheaply and as dependably as possible.

Ralph Winslow designed an 82 ft. by 19 ft. 8 in. by 9 ft. tug (illustrated below) and specified as the power plant a six cylinder Model W-24A Winton Oil Engine developing 300 H.P. This Tug Boat has the capacity of towing a boom containing approximately 3500 cords of wood, and it does its job consistently, dependably and efficiently.

Low operating costs, both for crew and fuel, plus compact installation, plus day in and day out dependability, make a Winton Oil Engine an ideal power plant for Tug Boats in general. Write for full descriptive literature pertaining to Winton Diesel Oil Engines.



WINTON ENGINE WORKS,

New York—A. G. Griese, Inc., 30 Church Street
Washington, D. C.—R. L. Fryer, 817 Albee Bldg. *Seattle*—H. W. Starrett,

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ton ENGINES

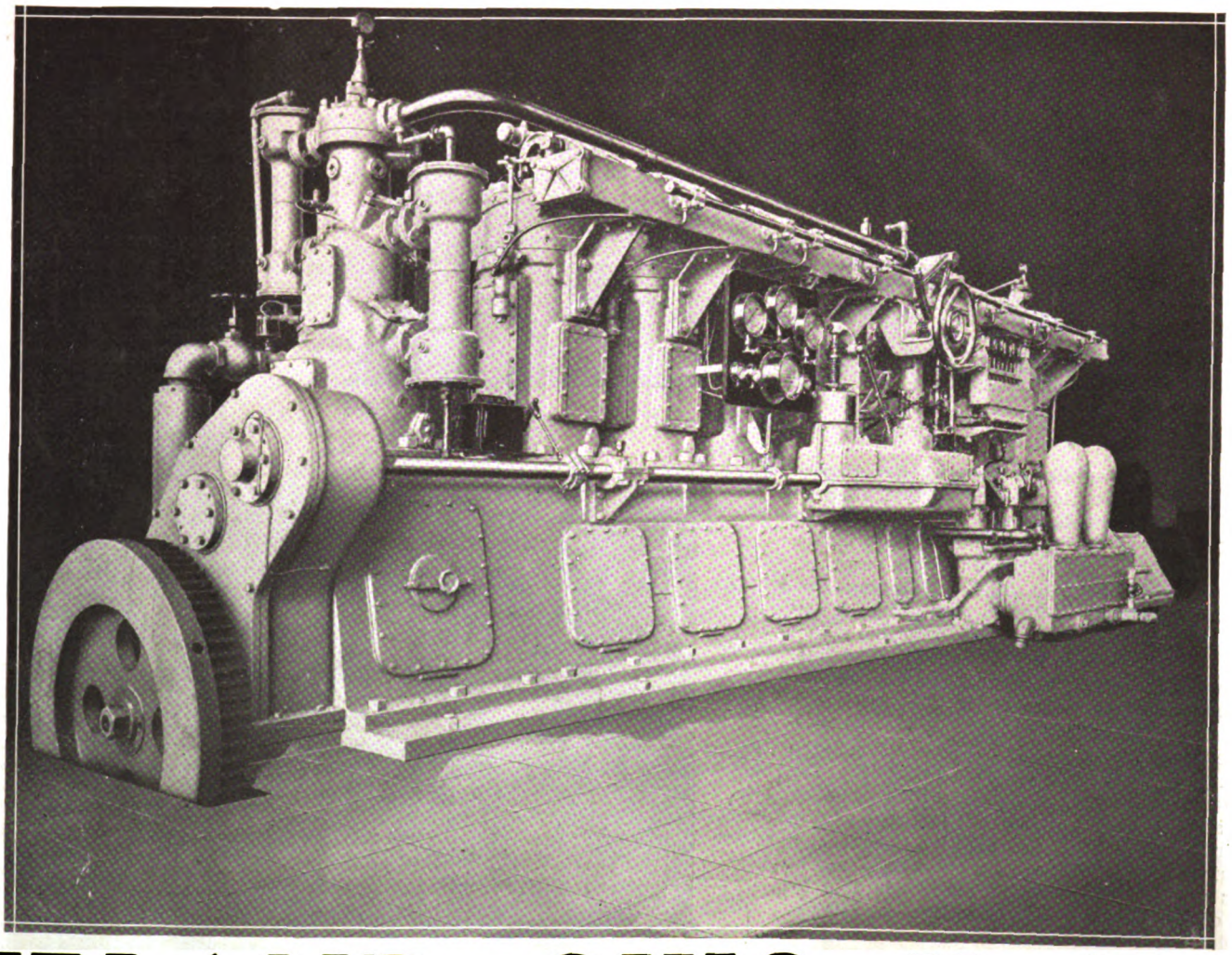
AN IMPORTANT ANNOUNCEMENT

It is a fact that commercial vessels employing obsolete methods of propulsion cannot to-day compete with ships driven with Diesel or Diesel-Electric Drive.

The Winton Engine Works have, from the outset, sponsored both types of Diesel Drive for varying conditions of service. We have available an immense amount of extremely valuable data which is unqualifiedly at the disposal of Ship Owners and Builders.

The facilities of the Winton Factory are of such a nature that we are prepared, especially at this time, to enter into and promptly complete contracts on a basis more favorable than this Industry has heretofore known.

Our Engineering Department is at YOUR disposal to assist you in working out details of re-powering existing vessels or laying out new installations.



CLEVELAND, OHIO, U. S. A.

Sunset Engine Co.

San Francisco—F. G. Bryant, 593 Market Street
Jacksonville—D. J. Carrison & Co.

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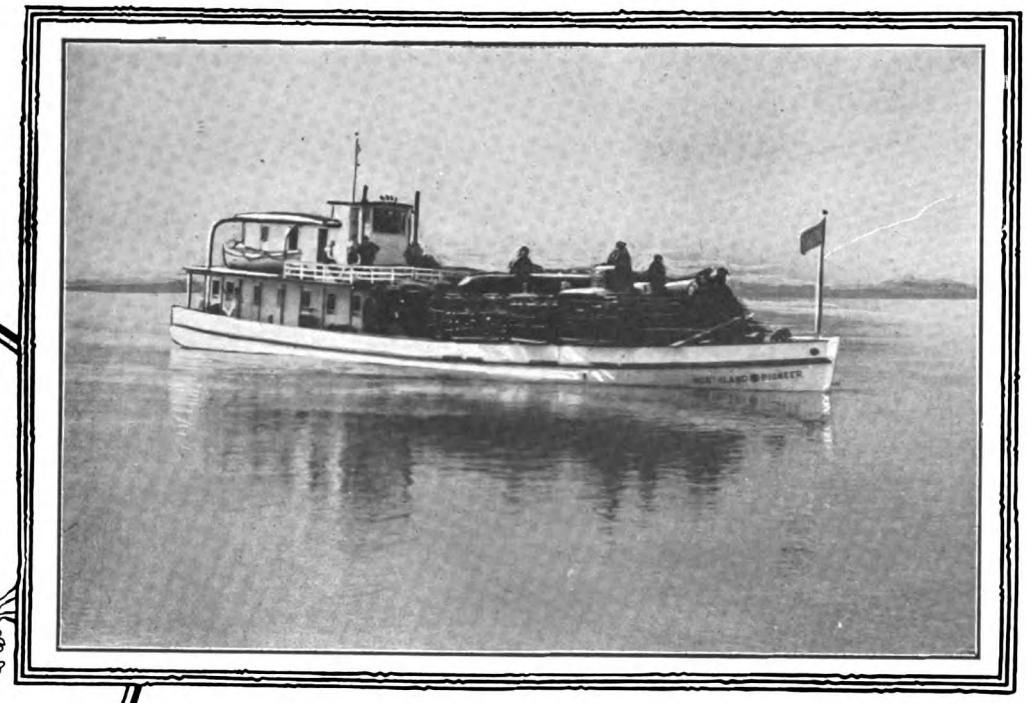
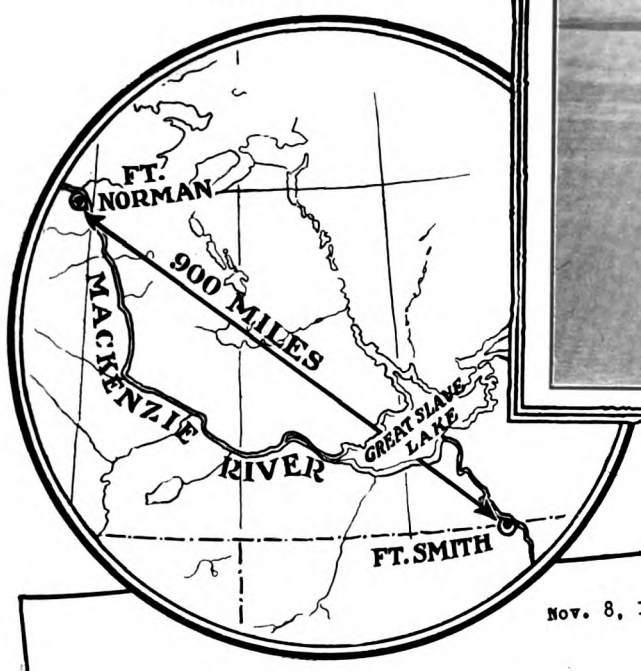
The "Northland Pioneer"

Length	100 ft.
Beam	20 ft.
Draft	4 ft. 8 in.

2-75 H.P. Dodge Heavy Oil Engines





Nov. 8, 1921.

Empire Engineering & Supply Co. Ltd.,
C. P. R. Building,
Edmonton, Alta.

Gentlemen:-

In reference to your request for information regarding the operation of the twin 75 H.P. Dodge Heavy Oil Engines, with which our new boat the Northland Pioneer was equipped at Fort Smith this Spring, we may say that these engines proved in service all you claimed for them.

On the voyage down from Fort Smith to the oil well near Fort Norman, we used kerosene, but as we did not wish to operate the engines at full speed immediately, no records of fuel consumption were kept.

At Fort Norman we took on crude oil from the Fort Norman Well, and while this oil was extremely dirty, the engines operated quite satisfactorily. Records kept on the return trip from Fort Norman showed a fuel consumption of .43 lbs. of fuel per B. H.P. Hour, which is less than the guarantee, and remarkable when compared with the fuel consumption of gasoline engines of a similar size on our other boats.

We can strongly recommend Dodge Engines for work in the north where conditions as you know require a simple, hardy, and economical engine. As a matter of fact, even if crude oil were not available in the north, and it was necessary to bring in kerosene or fuel oil for these engines, the fuel economy is such that the saving would pay for the engines in a short time.

Yours sincerely,

NORTHERN TRADING COMPANY,

Per. Roy Marsh Mgr.

RN/HM

1800 miles without trouble: fine record made by first oil powered vessel to make trip to Ft. Norman Oil Fields.

Loaded to the water line with casings, derrick timbers and machinery, through severe storms and difficult channels—1800 miles in all is the record of the successful trip from Ft. Smith to Ft. Norman, Canadian oil fields made by the "Northland Pioneer."

Read the engineer's story carefully. Note the fact that the two 75 H. P. engines operated successfully on the return trip using crude oil direct from the wells.

There was no time lost in taking on fuel wood —no valuable cargo space used for storage.

The record of the "Northland Pioneer" is not an unusual one for boats equipped with Dodge Heavy Oil Engines. Their sturdy simplicity—absence of trouble giving parts such as carburetors, switches, igniters, etc., fuel economy—ease of operation and low attendance costs adapts them to every class of work craft within range of sizes.

Prompt response will be made to inquiries from responsible dealers.

DODGE

HEAVY OIL ENGINES

12½ H. P. TO 75 H. P.

DODGE SALES AND ENGINEERING COMPANY

MISHAWAKA, INDIANA, U. S. A.

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HASLER & COMPANY INC.

NEW YORK, N. Y. NORFOLK, VA. NEWPORT NEWS, VA

STEAMSHIP MANAGERS AND AGENTS

LOADING BROKERS

Bunker and Cargo Coal Suppliers at all HAMPTON ROADS PORTS

WEST RELSAH COAL VIRGINIA

POCAHONTAS AND NEW RIVER

HIGH VOLATILE STEAM AND GAS COALS

ECONOMY EFFICIENCY DESPATCH

Cable and Wireless Address "RELSAH"

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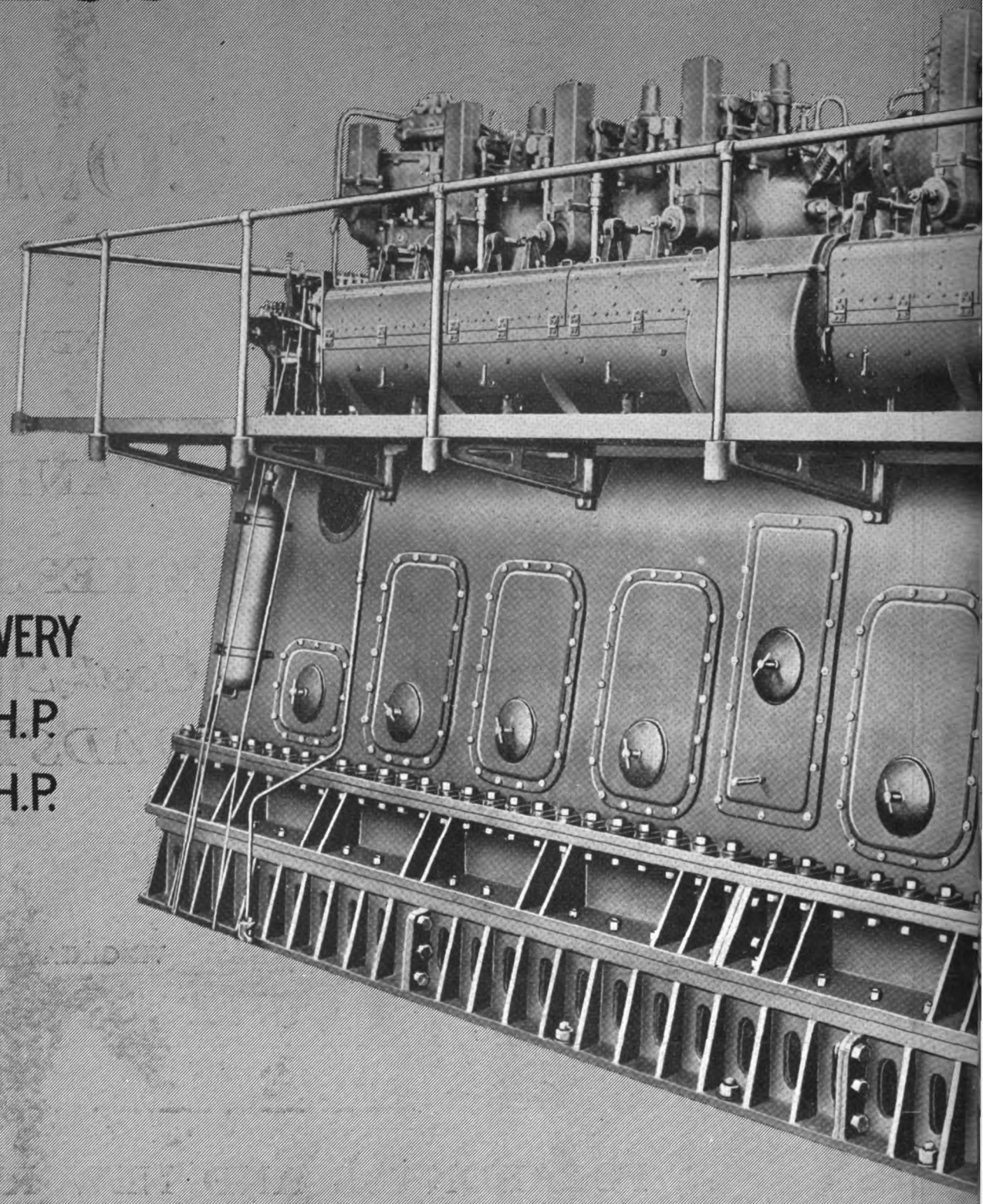
NELSECO DIESEL ENGIN



SIZES
FOR EARLY DELIVERY
120 H.P., 180 H.P.
240 H.P., 360 H.P.
480 H.P.

600-750 B.H.P., 225 R.P.M., 4 cycle, 6 cylinders
HEAVY-DUTY MARINE OR STATIONARY DIESEL ENGINE

NELSECO

New London Ship
Groton

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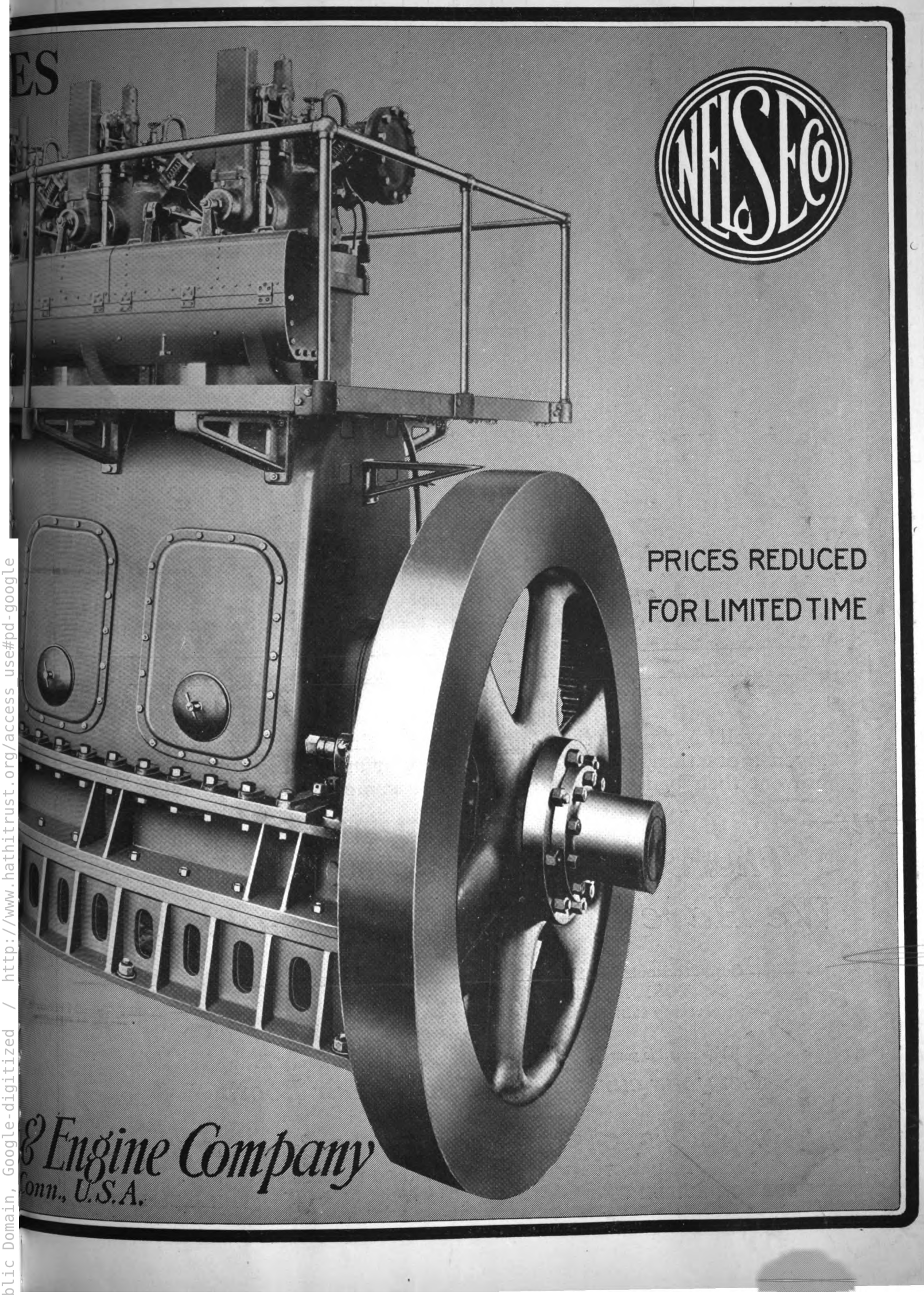

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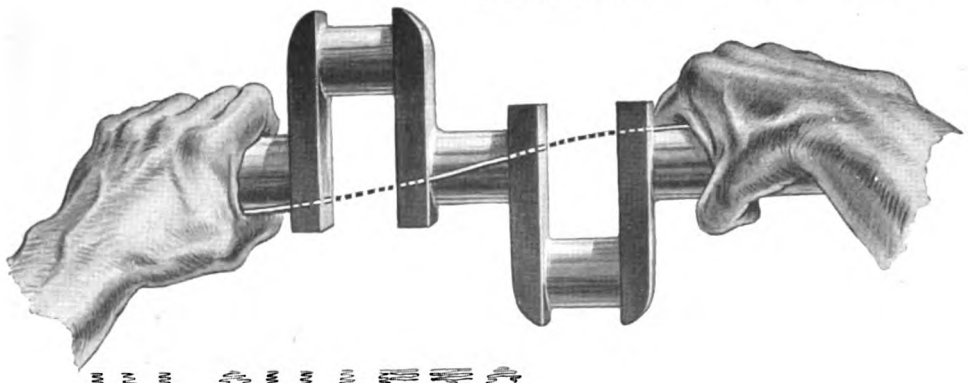
TORSIONAL VIBRATIONS



IN SHAFTS

THIS is what may be occurring hundreds, or thousands of times per minute in your shafts. And just as many reversals of this stress.

Can You Answer These Questions?

1. **At what speed will the trouble arise?**
   Can you anticipate the trouble, possibly obviate it by change in design?
2. **How quickly can Torsional Vibration be eliminated in an already existing shaft?**

It is a well known fact that *dampers*, of existing types, have never given a practical solution—erratic behavior and undependability prevent their being classed as a *positive remedy* for the trouble

But—

There is a Practical Remedy We Have Mastered this Problem

Come to Booth D 212 (4th floor Grand Central Palace) at the NEW YORK AUTOMOBILE SHOW, where we will have an interesting exhibit, and talk it over with our representatives

You owe it to yourself—as well as to your concern—to know the essentials

Let your curiosity lead you to our Booth

WE SOLVE VIBRATION PROBLEMS

Trade Mark Registered

VIBRATION SPECIALTY COMPANY

MANUFACTURERS OF NWA BALANCING MACHINES

HARRISON BUILDING PHILADELPHIA, PA.

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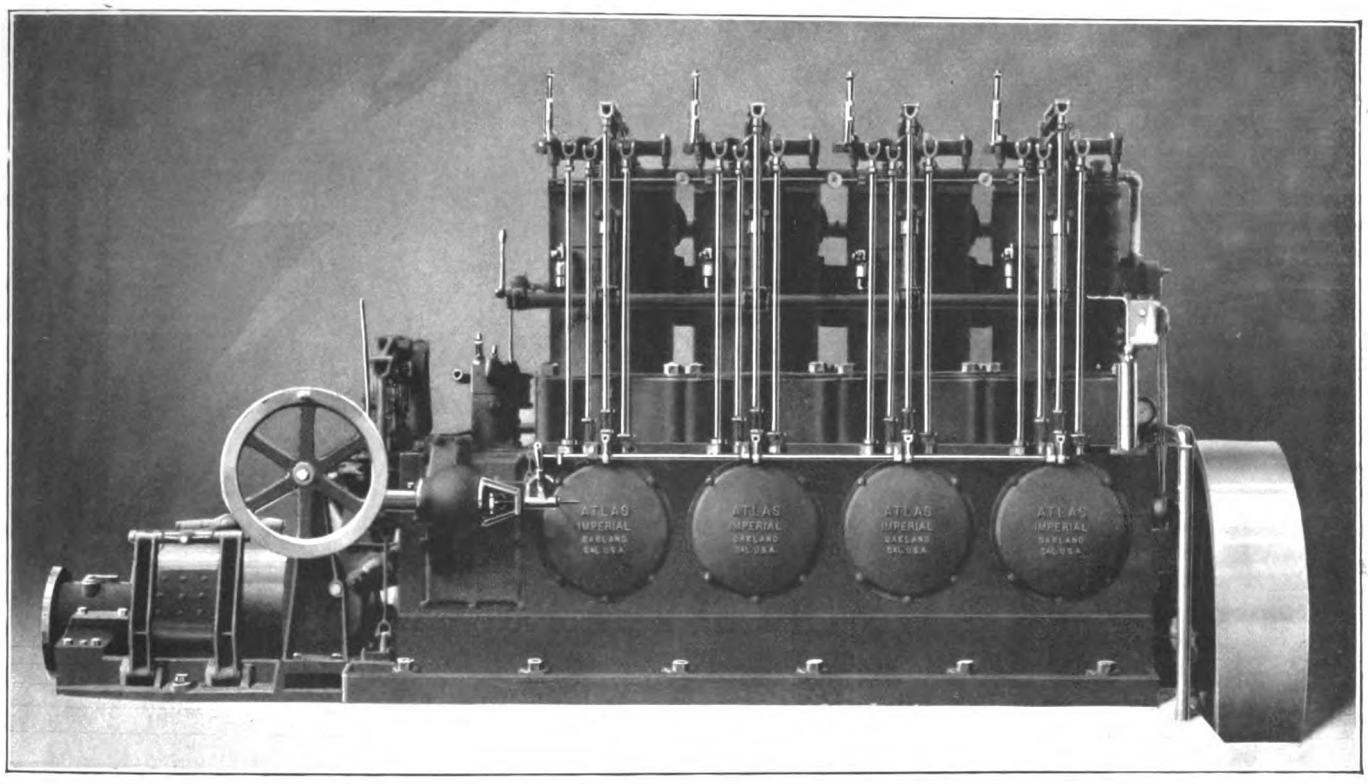
ATLAS-IMPERIAL

MECHANICAL-INJECTION DIESEL ENGINE

A REAL SOLUTION OF YOUR POWER PROBLEM

30 YEARS BUILDING ENGINES

MARINE



STATIONARY

165 H. P. MECHANICAL-INJECTION MARINE DIESEL-ENGINE
BUILT IN 3, 4 AND 6 CYLINDER TYPES 55 TO 350 HORSE-POWER

A POWERFUL, DEPENDABLE AND ECONOMICAL ENGINE, SIMPLE IN OPERATION AND BUILT FOR SERVICE

STOP BURNING UP YOUR PROFITS

DO YOU REALIZE THAT YOU CAN SAVE 90% OF YOUR DISTILLATE BILLS

BY USING OUR DIESEL ENGINES

100 HORSE-POWER FOR 20 CENTS PER HOUR

RUNS ON COMMERCIAL FUEL-OIL (CRUDE-OIL) COSTING $1.58 PER BBL. OF 42 GALS.

REPRESENTATIVES

ASTORIA, ORE.—Atlas-Imperial Engine Agency, 12th and Bond Sts.
HONOLULU, T. H.—H. A. Peterson, Box 155
JUNEAU, ALASKA—Charles G. Warner Company
NEW ORLEANS, LA.—J. G. Davis, 1324 Music St.
NOME, ALASKA—Alaska Lighterage and Commercial Co.
PAPETTE, TAHITI—Et Davio
SAN PEDRO, CAL.—Garbutt & Walch
SEATTLE, WASH.—Atlas Gas Engine Agency, 901 Western Ave.
SUVA, FIJI—Morris Hedstrom, Ltd.
VANCOUVER, B. C.—Ferrier and Lucas

ATLAS IMPERIAL ENGINE COMPANY

OAKLAND, CALIFORNIA

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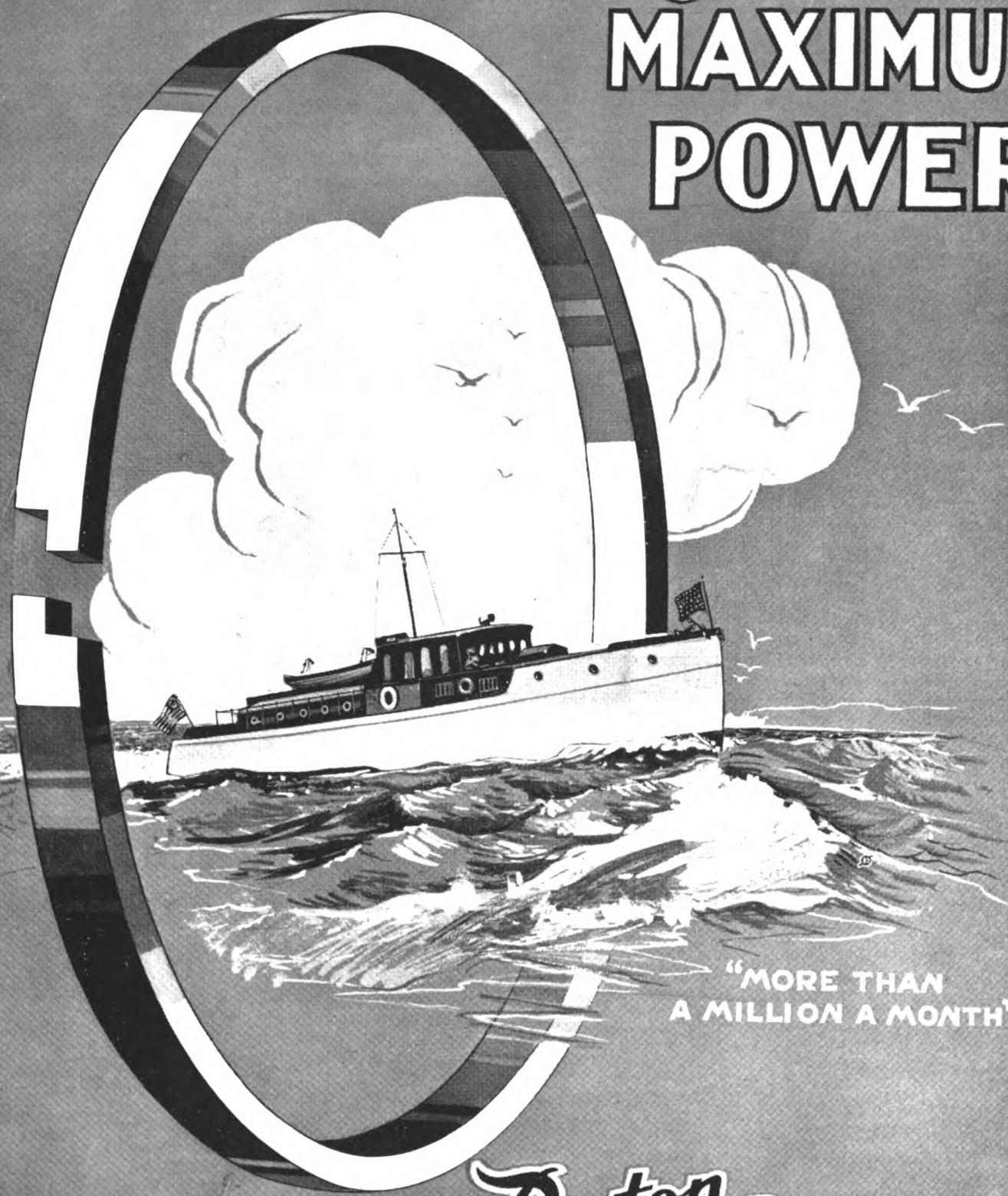
QUALITY SNAP RINGS — give MAXIMUM POWER



"MORE THAN A MILLION A MONTH"

THE Piston RING COMPANY

107 SANFORD ST. MUSKEGON, MICH.

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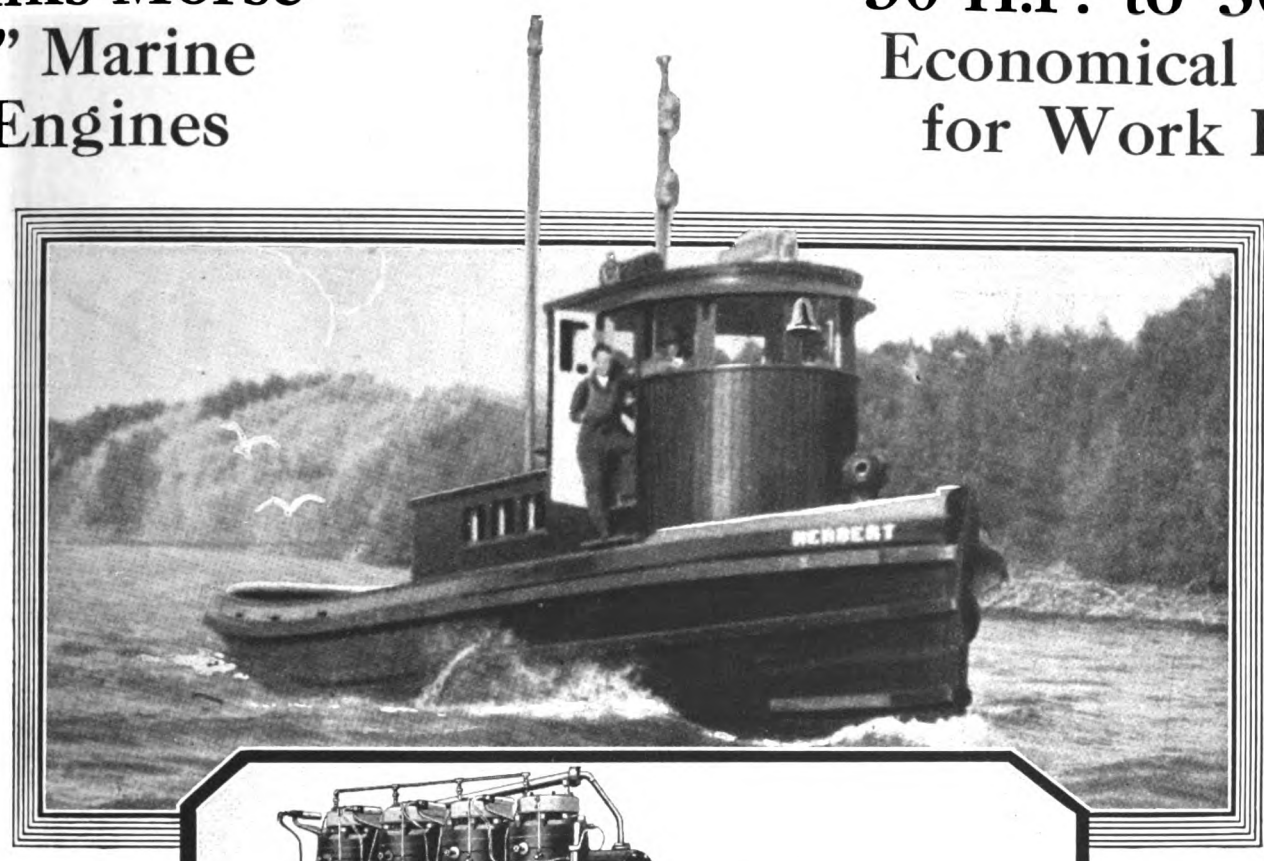
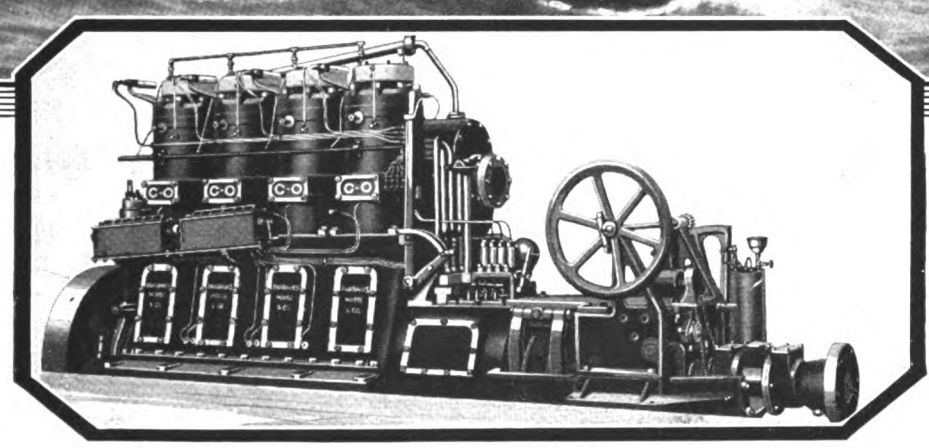
Fairbanks-Morse "C-O" Marine Oil Engines

30 H.P. to 300 H.P. Economical Power for Work Boats





Power from Low Cost Fuel Oils

The "Herbert" has a mighty desirable reputation as a money-maker due in large measure to the excellent operation of her "C-O" engine on low grade fuel oils.

"C-O" marine oil engines have been building up records of economy and dependability year after year. They use the low grade fuel oils most easily obtained—run steadily with perfect regulation in choppy seas—remain cool under the gruelling service of long hauls at low speed under heavy load. They are simple—require little attention. From every angle the "C-O" engine is the profit producing power for workboats.

Fairbanks, Morse & Co.

MANUFACTURERS CHICAGO

The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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BUNKER FUEL OIL

The vast organization and scope of the Standard Oil Company (New Jersey) make it possible to offer Shipping interests world-wide facilities for bunkering with "STANDARD" Fuel Oil. This service offers opportunities for effecting the decided economies resulting from the use of "STANDARD" Fuel Oil.

Ports at which deliveries can be made through arrangements with the Standard Oil Company (New Jersey), 26 Broadway, N. Y.

UNITED STATES

Atlantic and Gulf Ports

*New York
Boston
*Philadelphia
*Baltimore
*Norfolk
*Charleston
*New Orleans
*Baton Rouge

Pacific Coast Ports

*Seattle
Tacoma
Astoria
*Portland
*San Francisco
*Richmond
*Point Wells
*San Pedro
*San Diego
*Honolulu

CANADA

*Halifax
*Montreal
*Levis (Quebec)
*Vancouver
Prince Rupert

MEXICO

Tampico

PANAMA CANAL

Cristobal
*Balboa

WEST INDIES

Havana
Cienfuegos
Nuevitas
San Juan
Bermuda
Curacao
St. Thomas

SOUTH AMERICA

Rio de Janeiro
Santos
*Buenos Aires
*Campana
Montevideo
Valparaiso
*Talara

AZORES

Ponta Delgada

*Diesel oil also available

UNITED KINGDOM

*Purfleet
*Manchester
*Southampton
*Newcastle-on-Tyne
*Sunderland
*Liverpool
*Brixham
*Hull
*Thames Haven

GERMANY

Hamburg
Nordenham

AFRICA

Bizerta

TURKEY

Constantinople

GREECE

Piraeus

CHINA

Hong Kong Shanghai

JAPAN

Itosaki Nagasaki

STANDARD OIL COMPANY (New Jersey)

26 Broadway, New York

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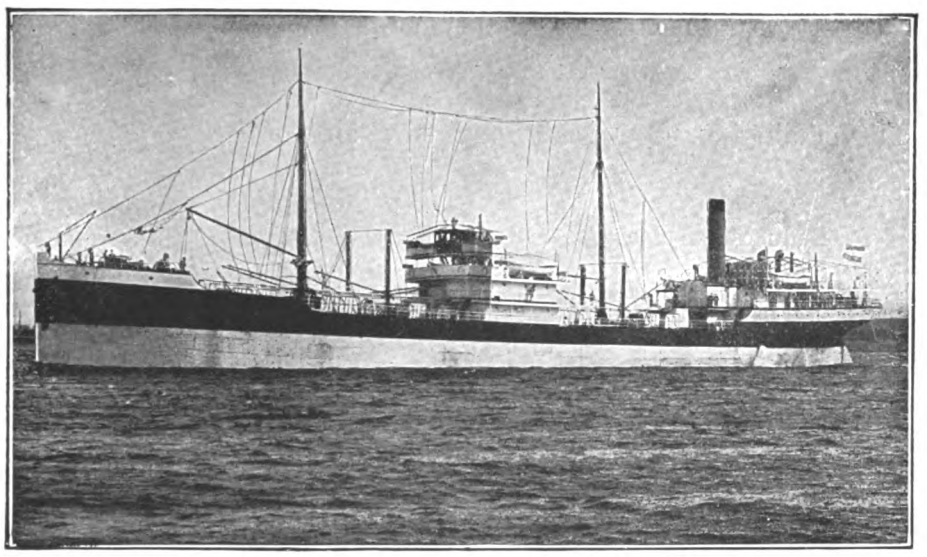
OIL FUEL

THE FUEL OF THE 20th CENTURY

Efficiency *Economy* *Cleanliness*



One of our Fleet of Oil-carrying Diesel-engined Motorships

The Asiatic Petroleum Co., Ltd.

ST. HELEN'S COURT, GREAT ST. HELEN'S, LONDON, E.C. 3,

CAN ARRANGE SUPPLIES OF

OIL FUEL for MOTORSHIPS, STEAMERS' BUNKERS and INDUSTRIAL PURPOSES at

Adelaide
Alexandria
Amsterdam
Antwerp
Aomori
Avonmouth
Augusta (Sicily)
Balboa (Panama Canal)
Balik Pappan
Bangkok
Barcelona
Barrow
Barton (Manchester Ship Canal)
Batavia
Bilbao
Boelebaai Ceram
Bombay
Buenos Ayres
Calcutta
Canton
Cape Town
Christiania (Soon)
Civita Vecchia
Colombo
Colon (Panama Canal)
Curacao
Gemsah
Genoa
Glasgow
Granton
Hankow
Havana
Hong Kong
Hull
Hurghada
Jarrow on Tyne
Karachi
La Guayra (Venezuela)
Las Palmas
Leghorn
Liverpool
Lisbon
London (Shellhaven & Thameshaven)
Macassar
Madras
Malmo
Malta
Manila
Maracaibo (Venezuela)
Marseilles
Melbourne
Miri
Mombasa
Montevideo
Montreal
Nagasaki
Naples
New Orleans
New York
Palembang
Palermo
Pangkalan Berandan
Penang
Perim
Pernambuco
Piraeus
Portland (Oregon)
Port Said
Port Soudan
Pulo Bukom
Puloe Samboe
Rotterdam
Rouen
Rio de Janeiro
Sabang
Saigon
Saitozaki
Salina Cruz (Pacific)
San Francisco
San Pedro
Santos
Seattle (Washington)
Shanghai
Singapore
Soerabaya
Southampton
Spezia
Stockholm
Suez
Sydney
Svolvaer
Tampico
Tarakan
Trieste
Trinidad
Tuxpan
Valparaiso
Vancouver
Venice
Vera Cruz
Yokohama

And New Stations are expected to be ready shortly at—

Antofagasta
Bordeaux
Cebu
Constantinople
Copenhagen
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BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N. Y., U. S. A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

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Price Oil Engines

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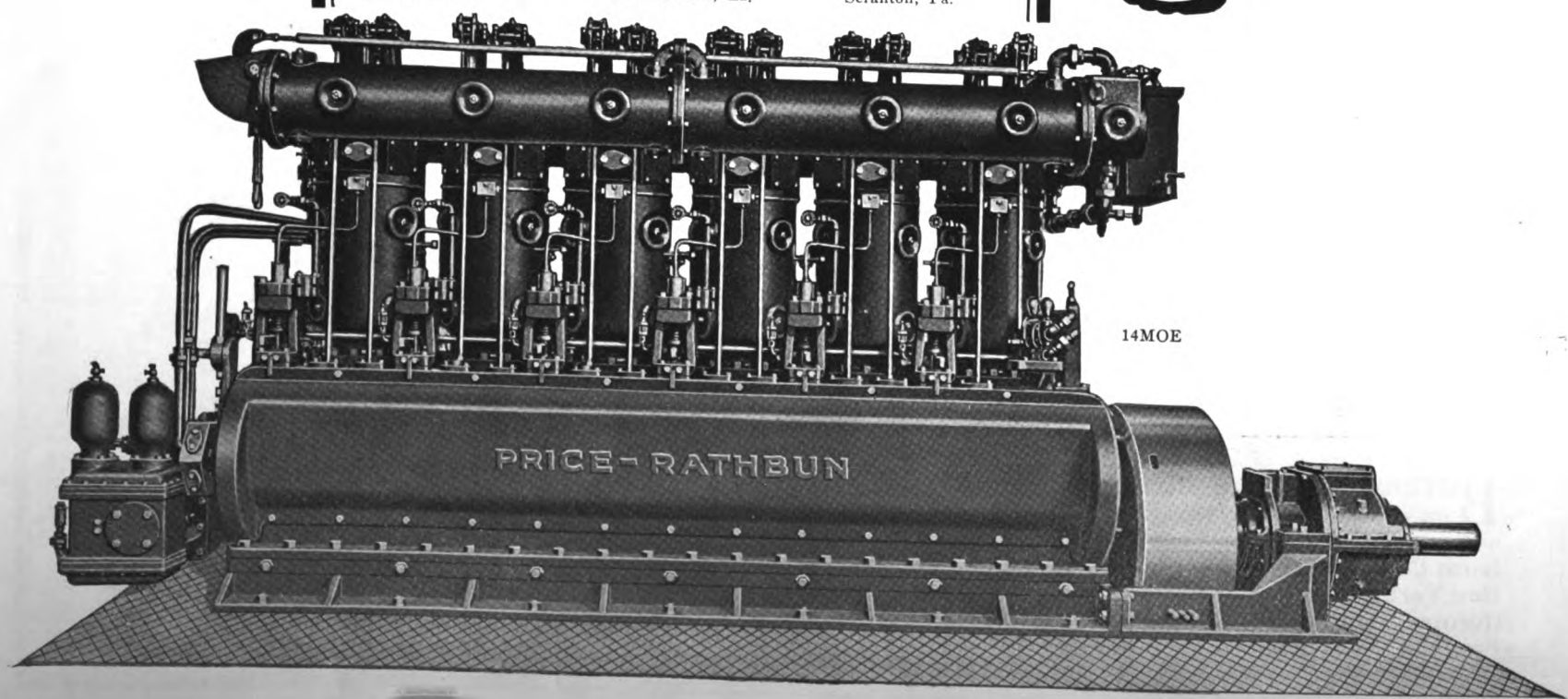

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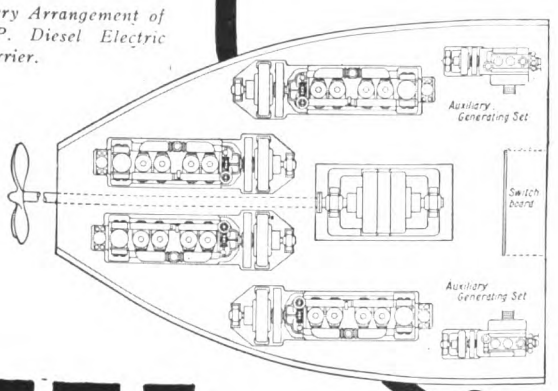
Machinery Arrangement of 2,500 H.P. Diesel Electric Cargo Carrier.



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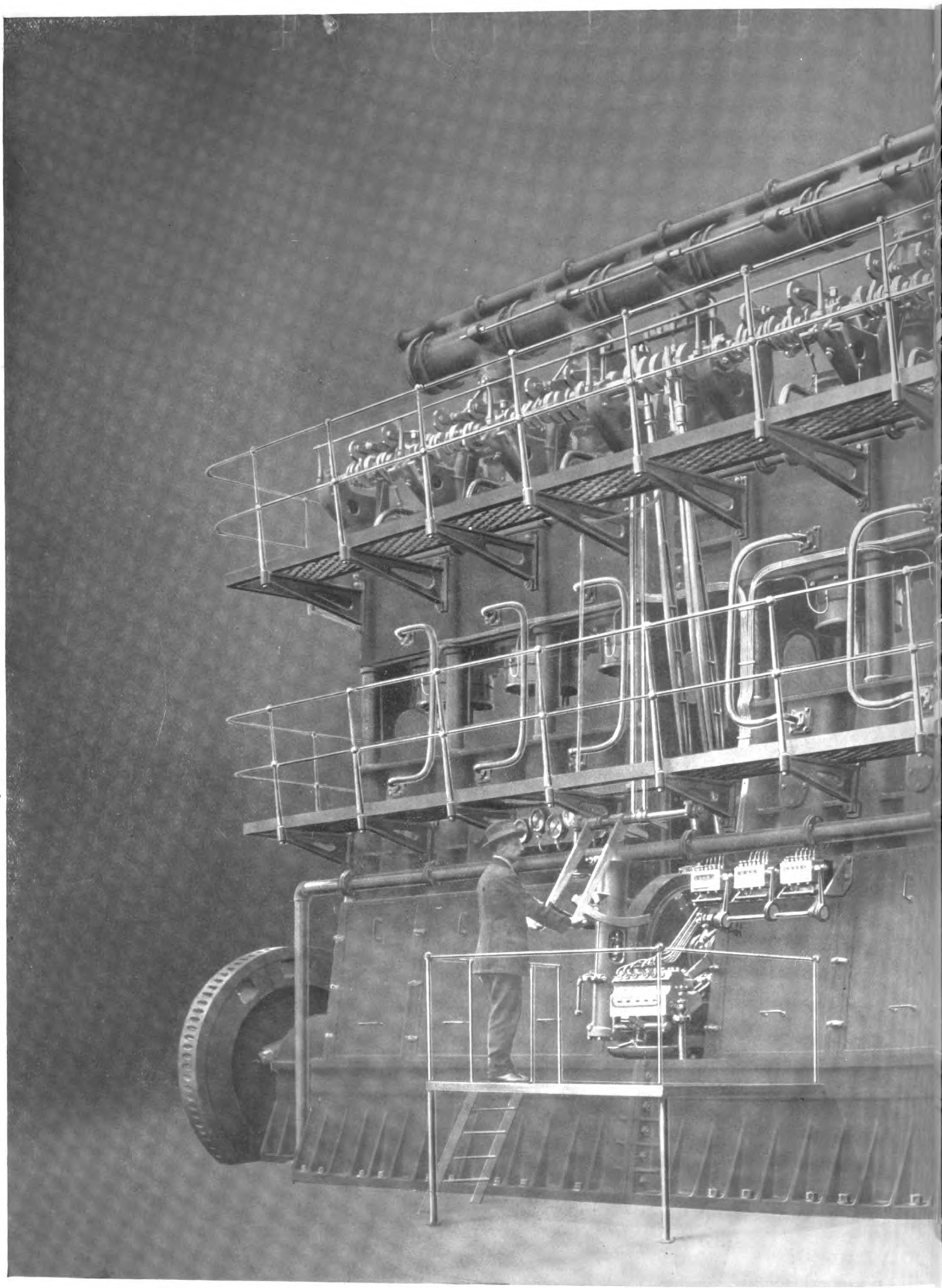

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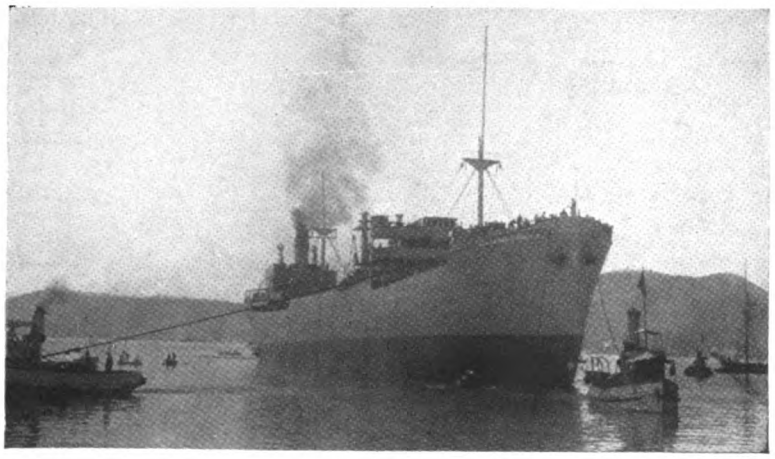

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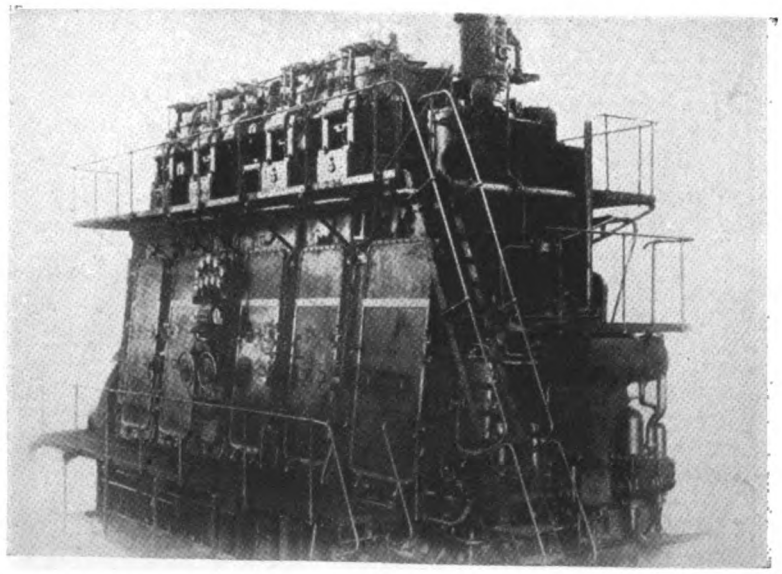

One of the Two Marine Diesel-Engines for the Motorship Ansaldo-San Giorgio III.

"Diesel" Engines for Industrial and Maritime Services

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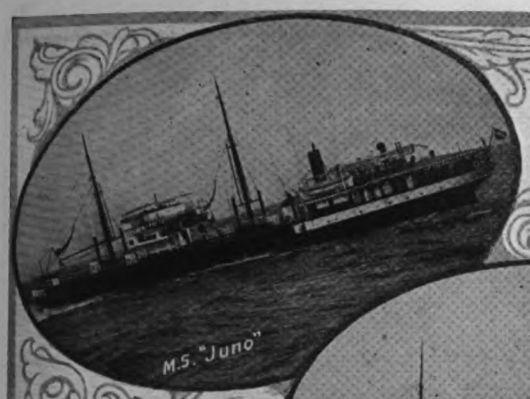
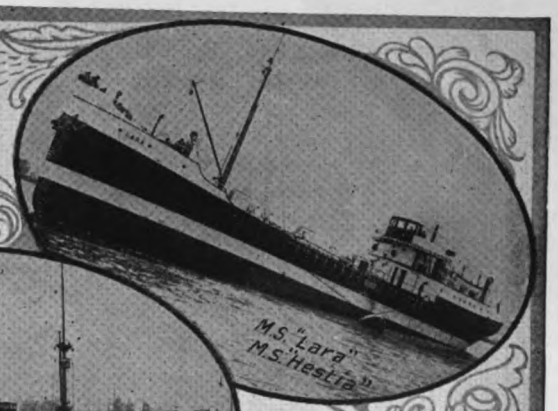
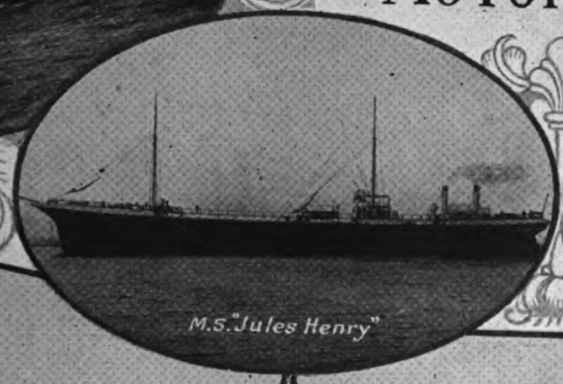
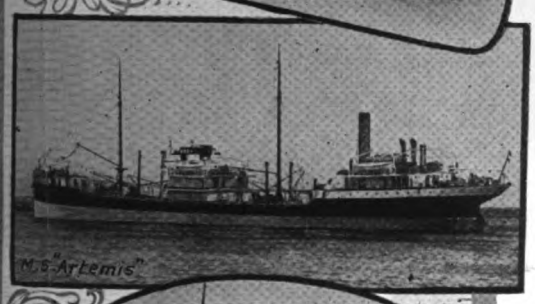
Some WERKSPOOR ENGINED MOTORSHIPS









1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
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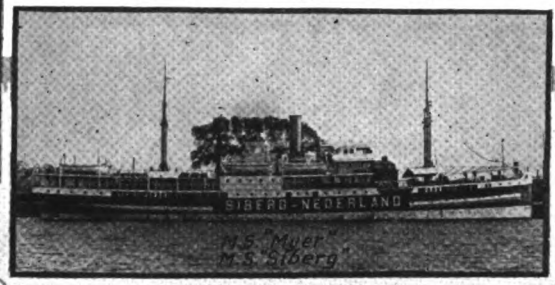

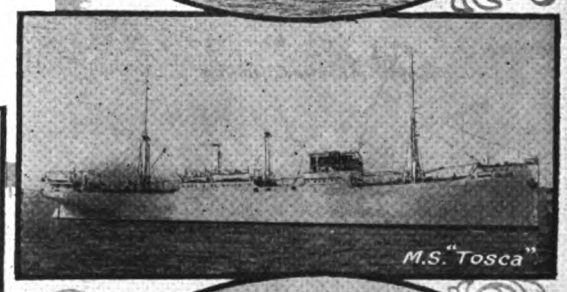

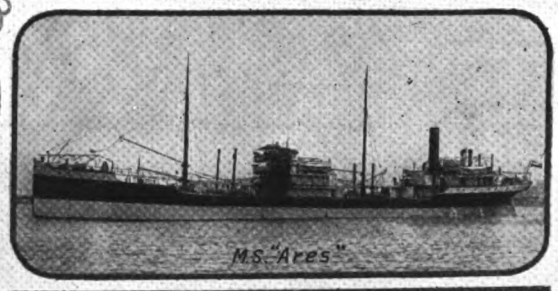

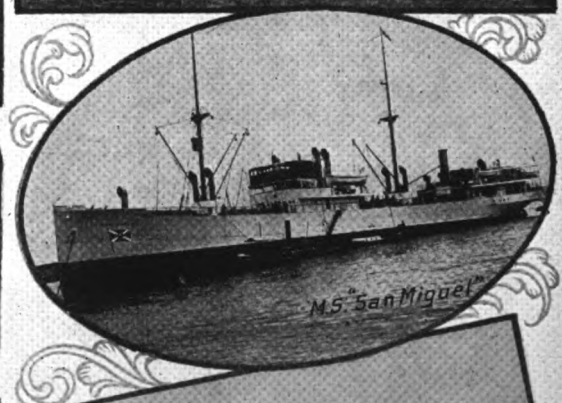

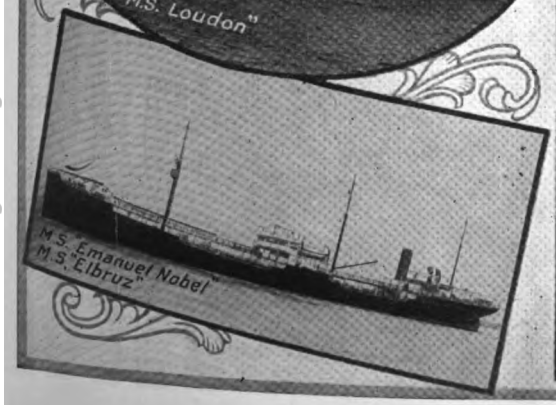

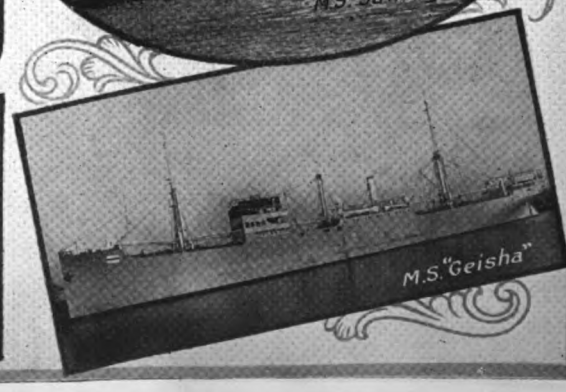

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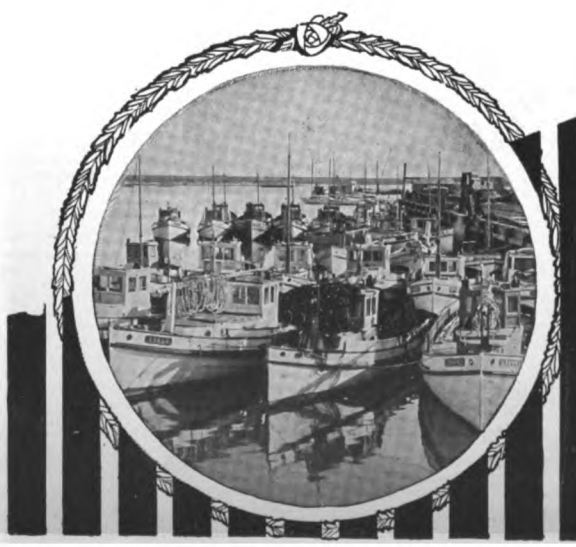

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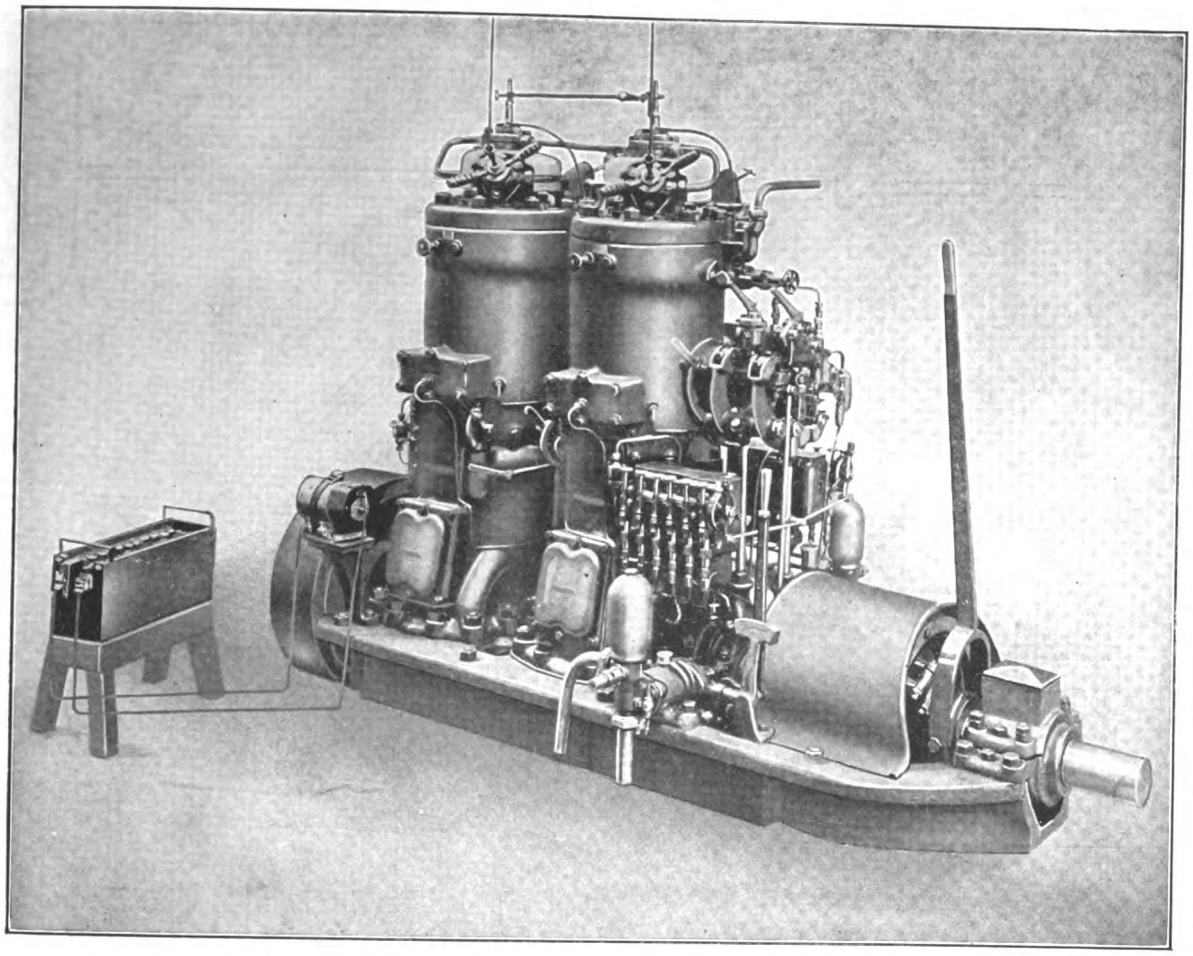
BOLINDERS



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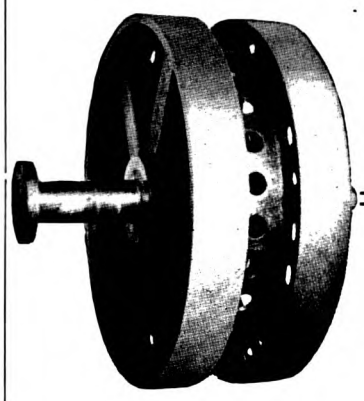

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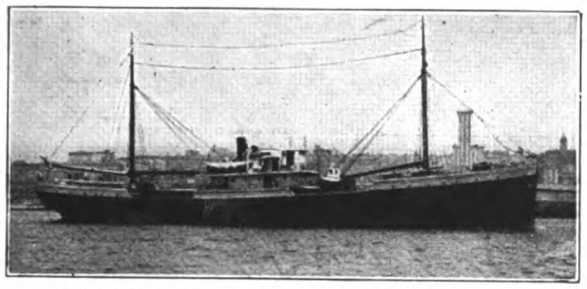

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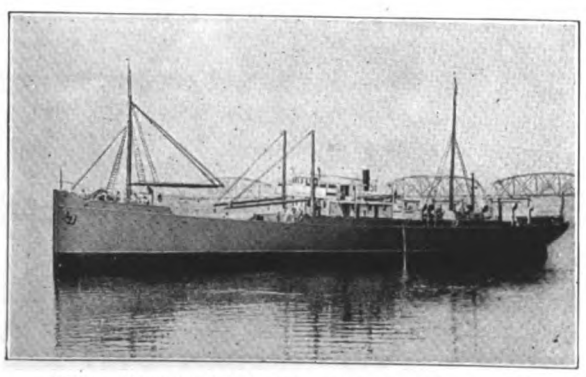

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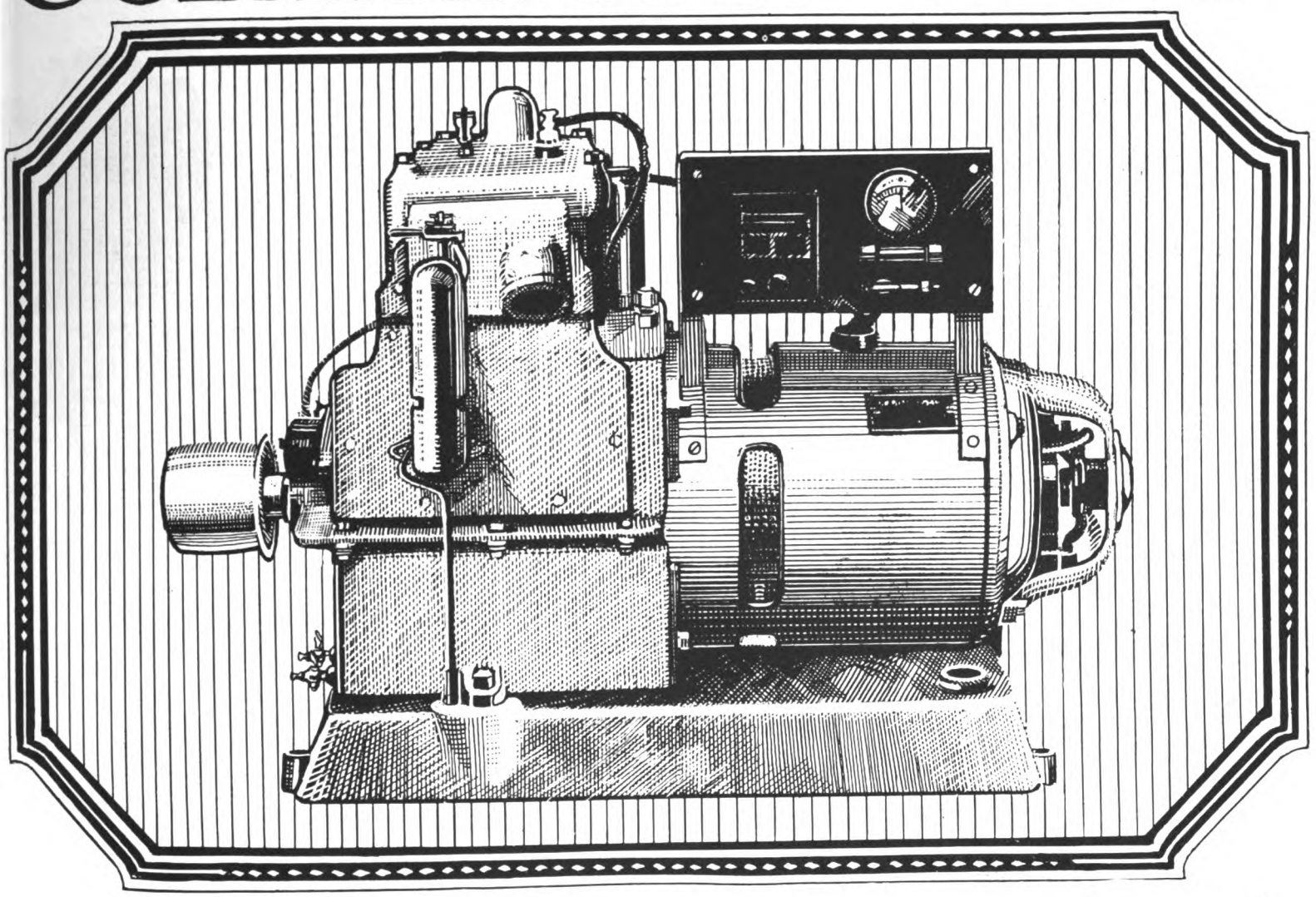

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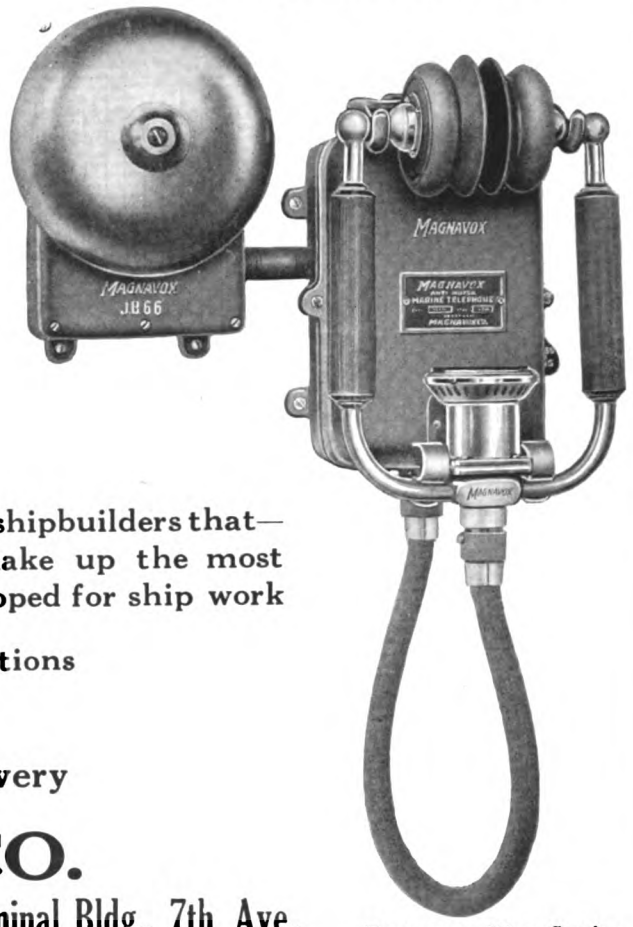

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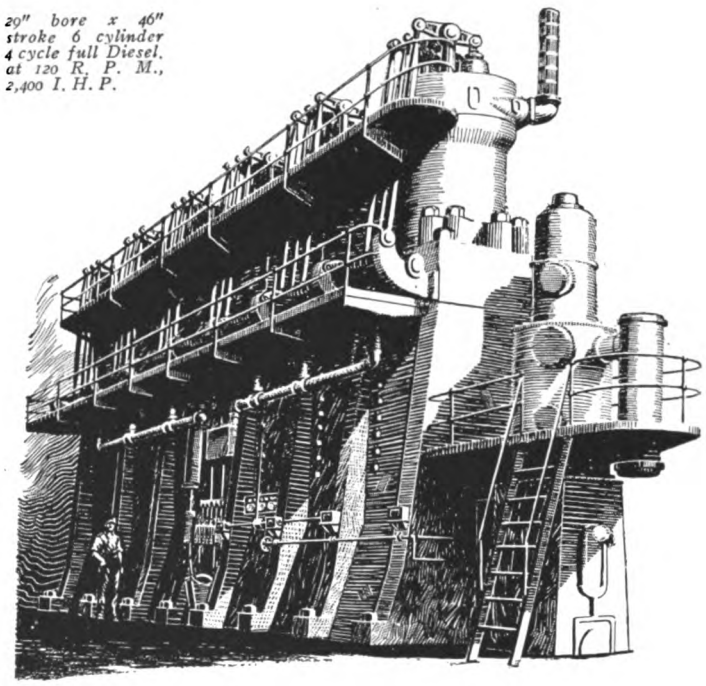
Worthington has been building internal-combustion engines for a quarter of a century. The latest is the 2,400 horse power marine Diesel shown at the right, built and tested at the Snow Works, Buffalo, N.Y. This engine with auxiliaries made by Worthington makes possible an all-American motorship engine-room with the least division of responsibility.

WORTHINGTON PUMP AND MACHINERY CORPORATION
115 BROADWAY, NEW YORK
Branch Offices in 24 Principal Cities

20" bore x 46" stroke 6 cylinder 4 cycle full Diesel, at 120 R. P. M., 2,400 I. H. P.



WORTHINGTON

Deane Works, *Holyoke, Mass.* Hazleton Works, *Hazleton, Pa.*
Blake & Knowles Works *East Cambridge, Mass.*
Worthington Works *Harrison, N. J.*
Laidlaw Works, *Cincinnati, Ohio* Gas Engine Works, *Cudahy, Wis.*
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W-54

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Shipbuilders, Engineers and Boiler-Makers

19 Berths, 140 to 820 feet
2 Berths for Floating Docks
River Frontage, 6,000 feet
6,000 Employees

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of a character that has no superior. A service that is constantly competing with itself.

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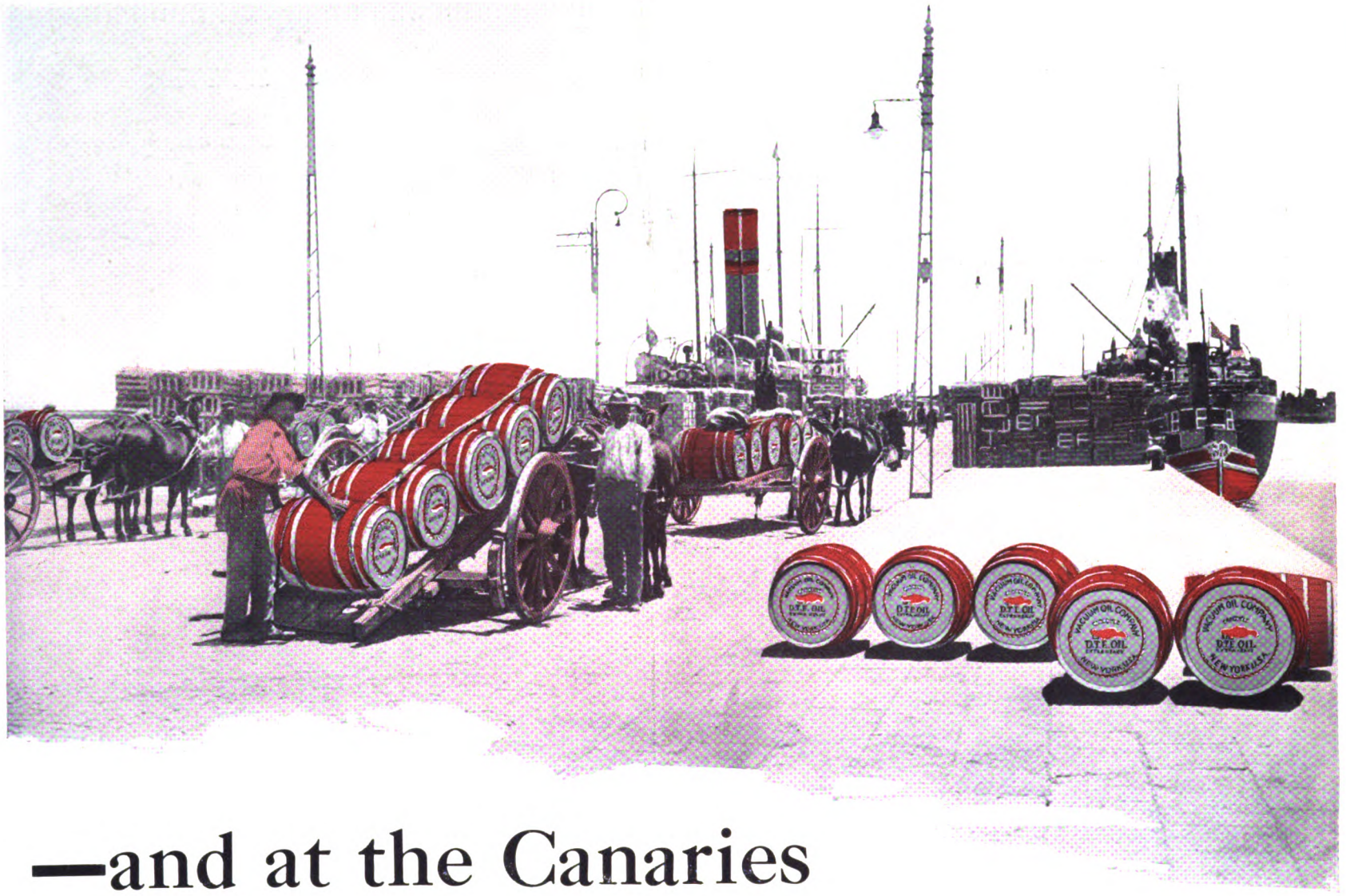

—and at the Canaries

"STOPPING at the Canaries" was first popularized 430 years ago by Columbus en route to his discovery of the American continent.

Today 7,000 or more vessels annually touch at the Canary ports of Las Palmas and Santa Cruz—and there they can always secure supplies of Gargoyle Marine Oils.

World distribution is one of the many reasons for the popularity of Gargoyle Marine Oils. At 250 ports all over the world these high-grade, dependable oils are supplied for the Correct Lubrication of the world shipping.

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VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* NEW YORK, U.S.A.

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McINTOSH & SEYMOUR CORPORATION

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Have Furnished Heavy-Duty Diesel Marine Engines for the Following Ships

Name of Vessel	Dead Weight Tonnage
CETHANA	3300
ISLA DE JAVA	4100
CHALLAMBA	3300
CULBURRA	3300
COCHINCHINE	2500
BAYONNE	1500
COOLCHA	3300
SOLITAIRE	5000
BENOWA	4400
BALCATTA	4400
BABINDA	4400
BOOBYALLA	4400
BORRIKA	4400
MARYLAND	4500
TEXACO No. 146	1000
TEXACO No. 147	1000
J. F. PENROSE	4500
BRAMELL POINT	5000
ASTMAHCO No. 3	3000
ASTMAHCO No. 4	3000
BACOI	2500
CAROLYN FRANCES	1000
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Seamen are familiar with the trouble exposed steam piping can cause in winter, and will welcome electric auxiliaries.

In frigid weather, frozen or bursted steam pipes can be prevented only by thorough draining, or by allowing steam to blow through them. These troublesome, wasteful processes are eliminated by electric auxiliaries.

Westinghouse electric auxiliaries are winter-proof, water-tight, simple to operate and to control, and are thoroughly reliable.

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East Pittsburgh, Pa.
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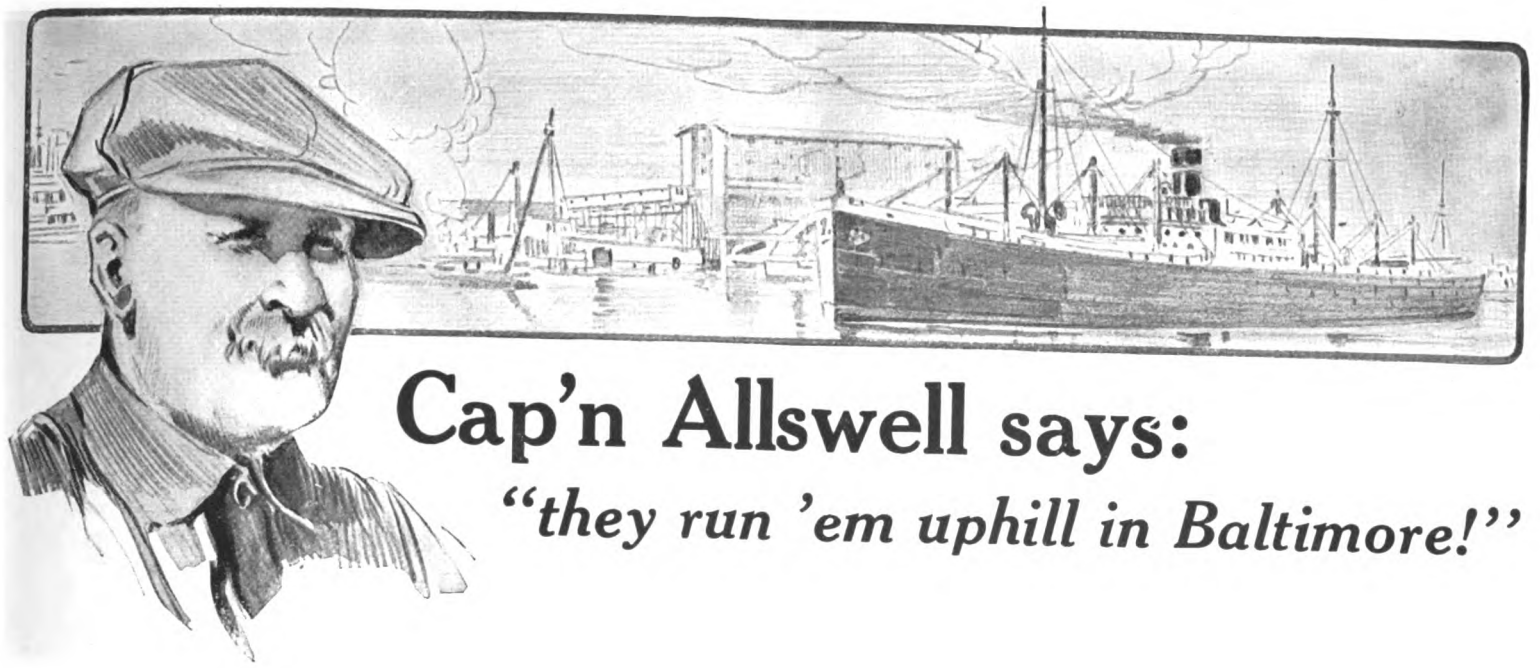

Cap'n Allswell says:

"they run 'em uphill in Baltimore!"

TAKE grain freighters, for instance. In Baltimore's where they load the ol' 500-footers till they have to build dikes atop the gunnels to keep the fire dry. It's such an uphill pull the engine thinks the hull's goin' sideways!
No wonder—with grain enough in the hold to load a couple of through freights.

I tell you, it's no fine-haired trick for a ladylike wheel. By the split tail of the holy shark, it takes a GIANT to move a cargo like that—which is why you see Columbian Bronze Propellers on the job there.

You can't beat 'em for hard work. When they turn over, things move. And strength? They say Columbian Bronze 'll stand a breakin' strain of 65,000 pounds to the inch—which I can easily believe, because I've seen 'em go afoul of a rock in a heavy blow and never hang up the boat. Take a hunch from the ol' man: install a Columbian an' all's well!

Send for the

"COLUMBIAN BULLETIN"

It bears out the Cap'n's statements with actual facts and figures, and other information. No charge; ask for Bulletin No. 12.

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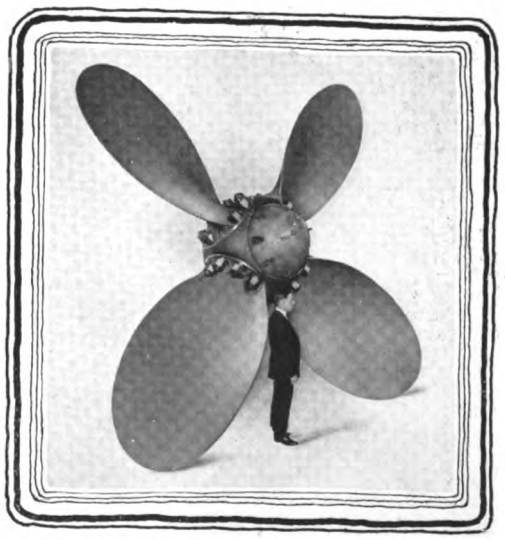
522 Fifth Ave., New York City
For New York Sales Only: 44 Third Avenue



Block "L" Main Floor, New York Motor Boat Show

COLUMBIAN *Bronze* PROPELLERS

for every craft afloat

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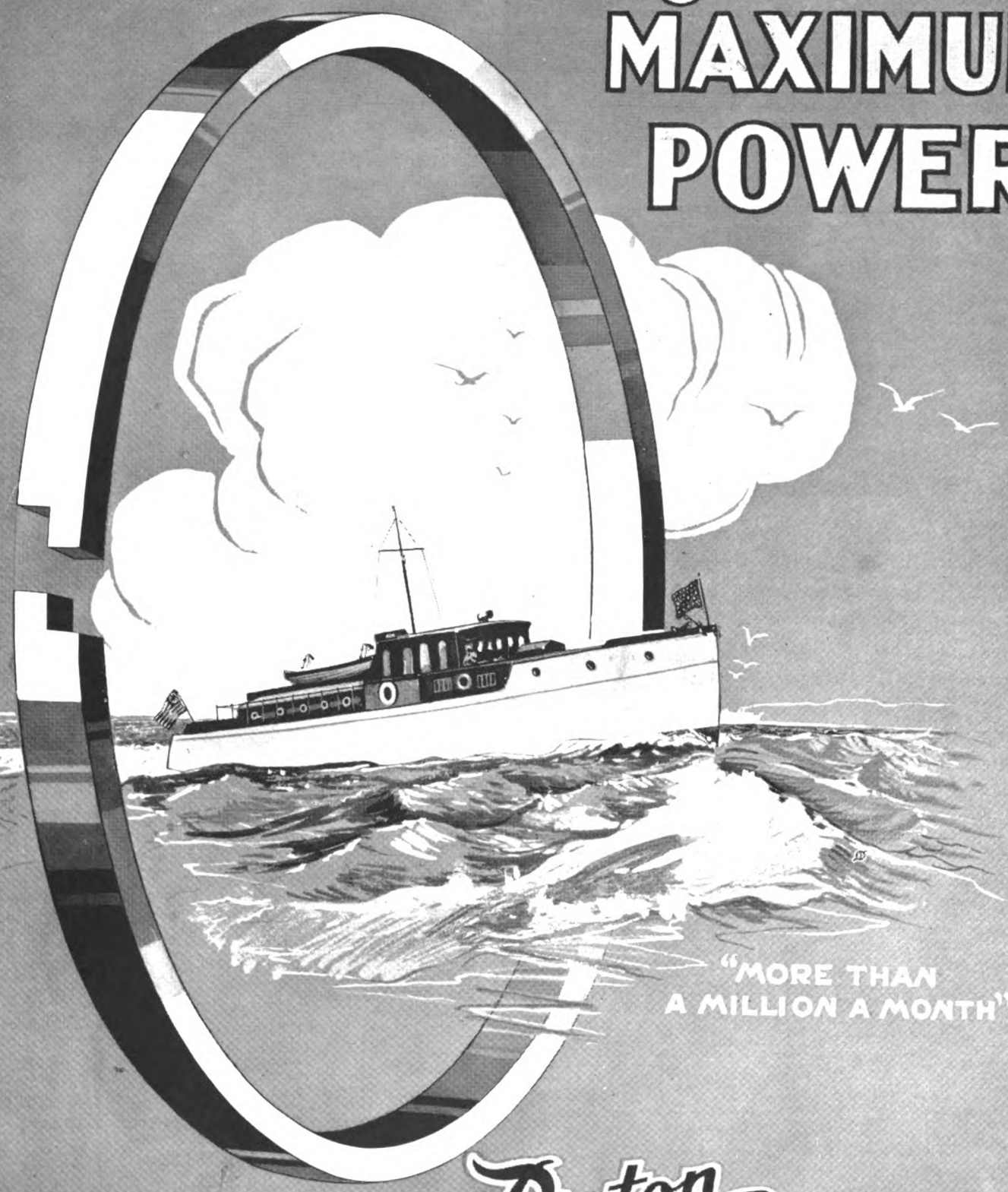
QUALITY SNAP RINGS — give MAXIMUM POWER



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THE Piston RING COMPANY

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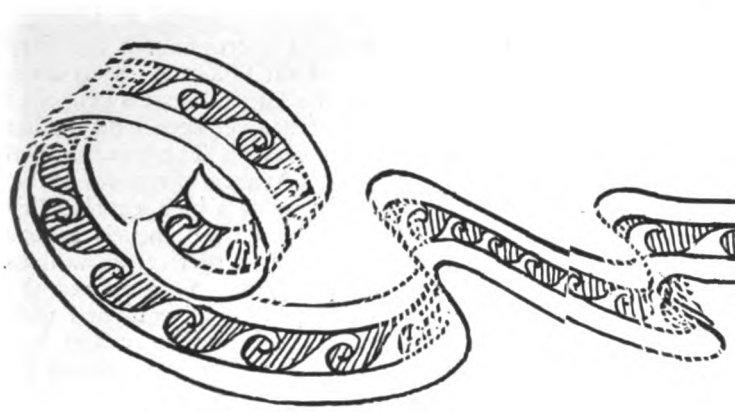

Win

OIL DIESEL
TYPE E

A DIESEL DRIVEN TUG-BOAT

The Abitibi Power & Paper Co., Ltd., had a towing problem, they had to move their paper pulp logs about 25 miles up the Abitibi River in Canada and they wanted to do it as cheaply and as dependably as possible.

Ralph Winslow designed an 82 ft. by 19 ft. 8 in. by 9 ft. tug (illustrated below) and specified as the power plant a six cylinder Model W-24A Winton Oil Engine developing 300 H.P. This Tug Boat has the capacity of towing a boom containing approximately 3500 cords of wood, and it does its job consistently, dependably and efficiently.

Low operating costs, both for crew and fuel, plus compact installation, plus day in and day out dependability, make a Wilton Oil Engine an ideal power plant for Tug Boats in general. Write for full descriptive literature pertaining to Winton Diesel Oil Engines.

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Washington, D. C.—R. L. Fryer, 817 Albee Bldg. *Seattle*—H. W. Starrett,

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AN IMPORTANT ANNOUNCEMENT

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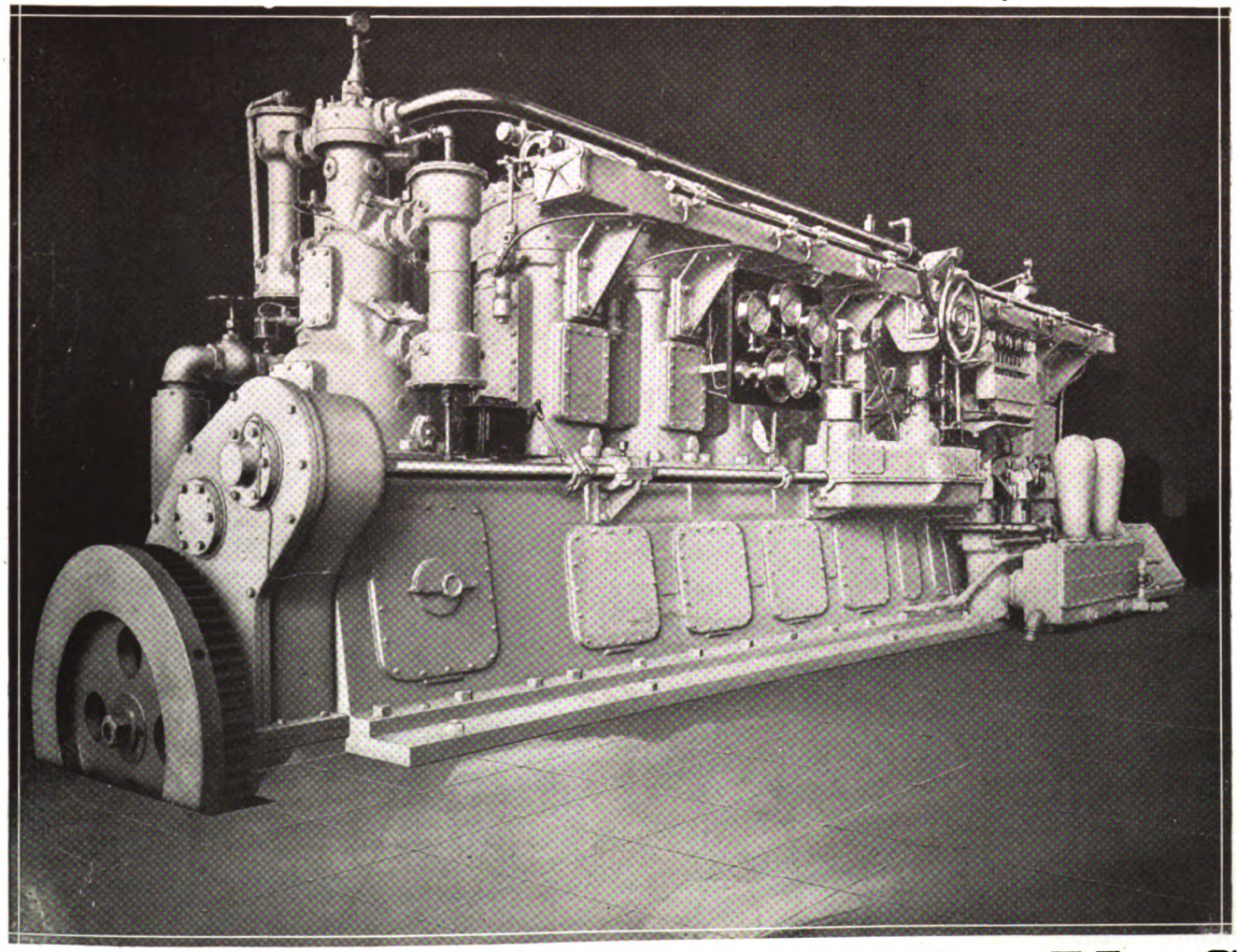
The Winton Engine Works have, from the outset, sponsored both types of Diesel Drive for varying conditions of service. We have available an immense amount of extremely valuable data which is unqualifiedly at the disposal of Ship Owners and Builders.

The facilities of the Winton Factory are of such a nature that we are prepared, especially at at this time, to enter into and promptly complete contracts on a basis more favorable than this Industry has heretofore known.

Our Engineering Department is at YOUR disposal to assist you in working out details of re-powering existing vessels or laying out new installations.



CLEVELAND, OHIO, U. S. A.

Sunset Engine Co.

San Francisco—F. G. Bryant, 593 Market Street
New Orleans—A. Baldwin Company

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Ports at which deliveries can be made through arrangements with the Standard Oil Company (New Jersey), 26 Broadway, N. Y.

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Tacoma
Astoria
*Portland
*San Francisco
*Richmond
*Point Wells
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*San Diego
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CANADA

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*Levis (Quebec)
*Vancouver
Prince Rupert

MEXICO

Tampico

PANAMA CANAL

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THE AGGREGATE H.P. IN VESSELS
FROM 1500 TO 6600 I.H.P. AND
THE NUMBER OF SUCCESSFUL
MOTORSHIPS IN OPERATION
EXCEED ALL OTHER
SYSTEMS COMBINED
AND NO ENGINE BUILT
TO THIS SYSTEM HAS
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ACCURACY AND INTERCHANGEABILITY
ASSURED BY MODERN JIGS
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PROPER MATERIALS BY
CRAMPS' IRON, STEEL AND
BRASS FOUNDRIES
CONTROLLED BY A
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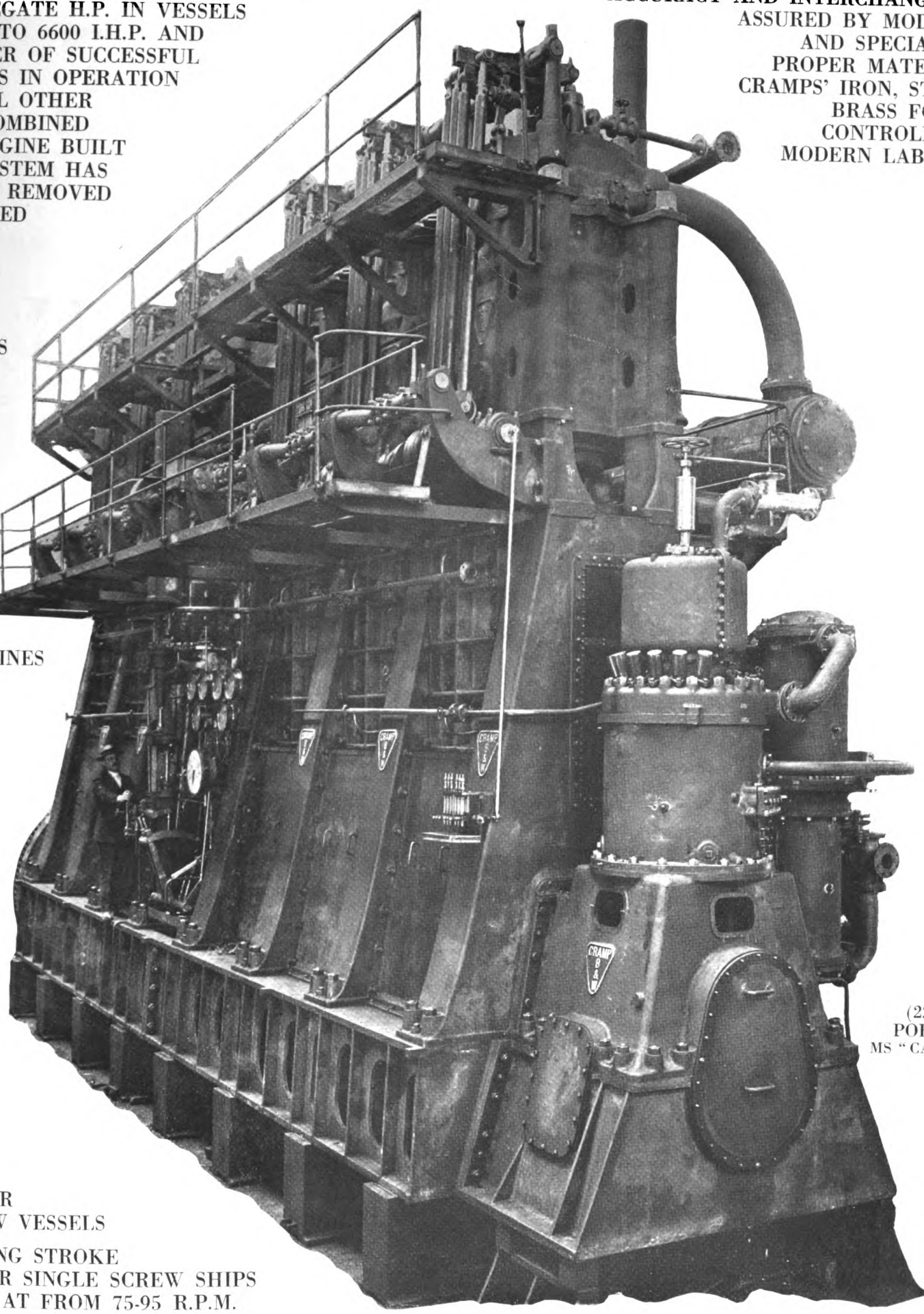
MOTORSHIPS
THAT STAY
ON THE
SEAS

DIESEL ENGINES
THAT STAY
IN THE
SHIPS



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PORT ENGINE
MS "CALIFORNIAN"

STANDARD
ENGINES FOR
TWIN SCREW VESSELS

SPECIAL LONG STROKE
ENGINES FOR SINGLE SCREW SHIPS
OPERATING AT FROM 75-95 R.P.M.

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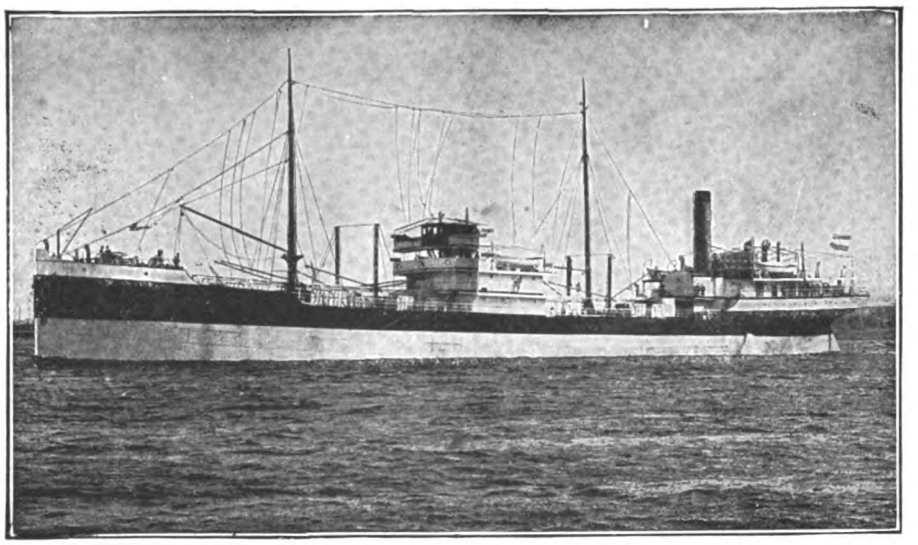
THE FUEL OF THE 20th CENTURY

Efficiency *Economy* *Cleanliness*



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The Asiatic Petroleum Co., Ltd.

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Calcutta
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BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N.Y., U.S.A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

THE Asiatic Petroleum Company also supply **Kerosene Oil** for use in the smaller Internal-combustion Engines and are prepared to supply **Petroleum Spirits, Lubricating Oils, Wax** and **Greases** in all Far Eastern Markets.

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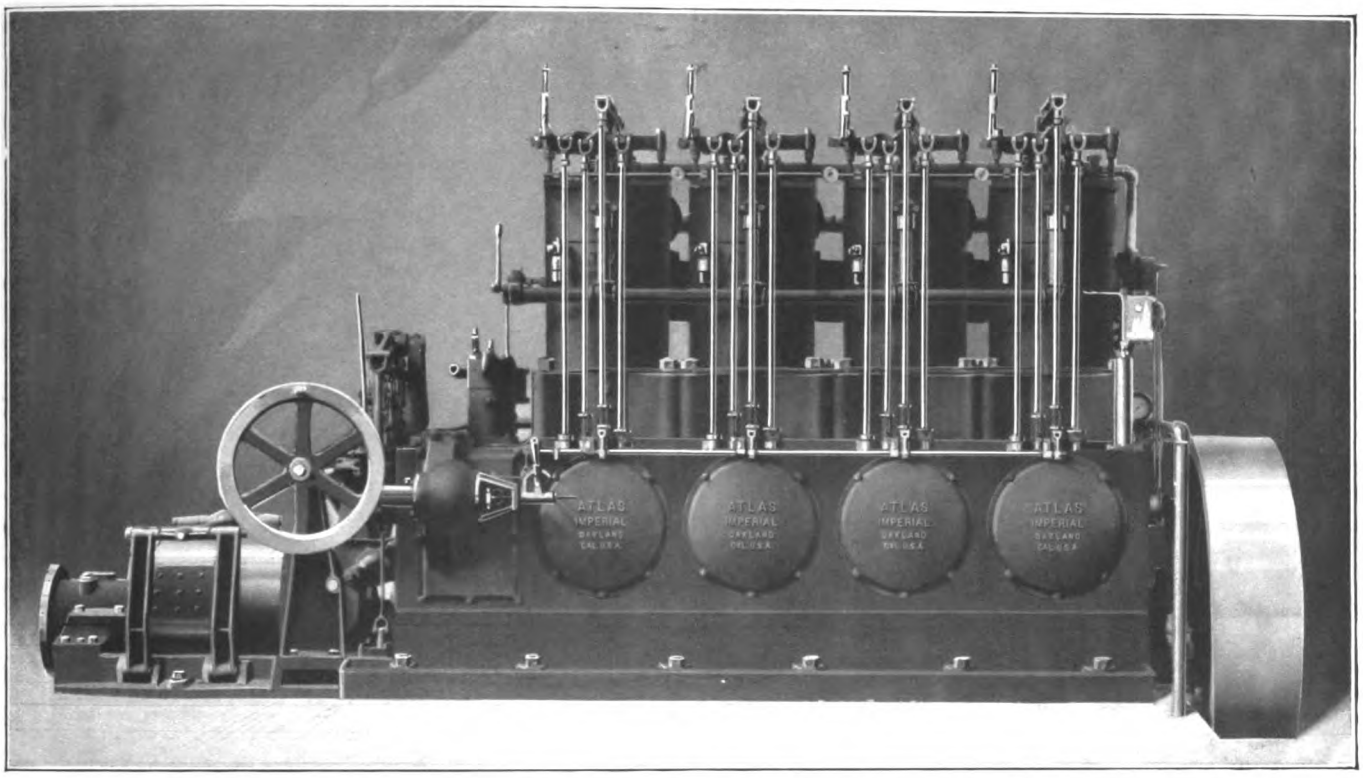

165 H. P. MECHANICAL-INJECTION MARINE DIESEL-ENGINE
BUILT IN 3, 4 and 6 CYLINDER TYPES 55 TO 500 HORSE-POWER

A DOLLARS AND CENTS PROPOSITION?

To users of Gas Engines:

All the money you pay for fuel for a gas-engine is burned up, blown out through the exhaust-pipe and lost forever. NOW if you could save *90%* of that money you would not hesitate to do it, would you? You *can* save that *90%* by replacing your gas-engine with our Mechanical-Injection Diesel-engine.

Now it does not take much running each day to burn up the price of our Diesel-engine in your gas-engine.

Our Mechanical-Injection Diesel-engine has about 20% less repair expense than a gas-engine, is easier and more simple to operate than a gas-engine and absolutely dependable.

The actual cost of operation is $0.0032 per horsepower hour with fuel-oil at 6c per gallon and $0.0005 per horsepower hour for lubricating-oil at 50c per gallon. This is equivalent to 37c per hour for 100 horsepower.

Now be fair with yourself and consider this matter. Figure out your *loss* yourself, or send us the power of your engine, time operated each day and the fuel-consumption, and our engineering department will submit reliable figures to you showing the amount of money you can save by putting in our Mechanical-Injection Diesel-engine; furthermore, we will guarantee our statements.

For over 30 years we have been designing and building internal-combustion engines, and air-injection Diesel-engines for eight years. Our air-injection engines are working in all parts of the globe and giving excellent service and satisfaction.

Our Mechanical-Injection Diesel-engine, as the name implies, injects the fuel into the combustion-chamber by mechanical means, where it is ignited by the *heat of compression only, no hot-points, balls, or surfaces of any kind,* and the maximum working-compression is 350 lbs. per square inch. By this means of spraying the fuel-oil into the combustion-chamber we are able to eliminate all the high-pressure air and the expense, repairs, dangers and adjustments incidental to the use of high-pressure air for fuel-injection.

Get in touch with us or one of our representatives at once and determine whether 90% of your gas-engine fuel bills are worth saving.

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ASTORIA, ORE.—Atlas-Imperial Engine Agency, 12th and Bond Sts.
HONOLULU, T. H.—H. A. Peterson, Box 155
JUNEAU, ALASKA—Charles G. Warner Company
NEW ORLEANS, LA.—J. G. Davis, 1324 Music St.
NOME, ALASKA—Alaska Lighterage and Commercial Co.
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ATLAS IMPERIAL ENGINE COMPANY
OAKLAND, CALIFORNIA

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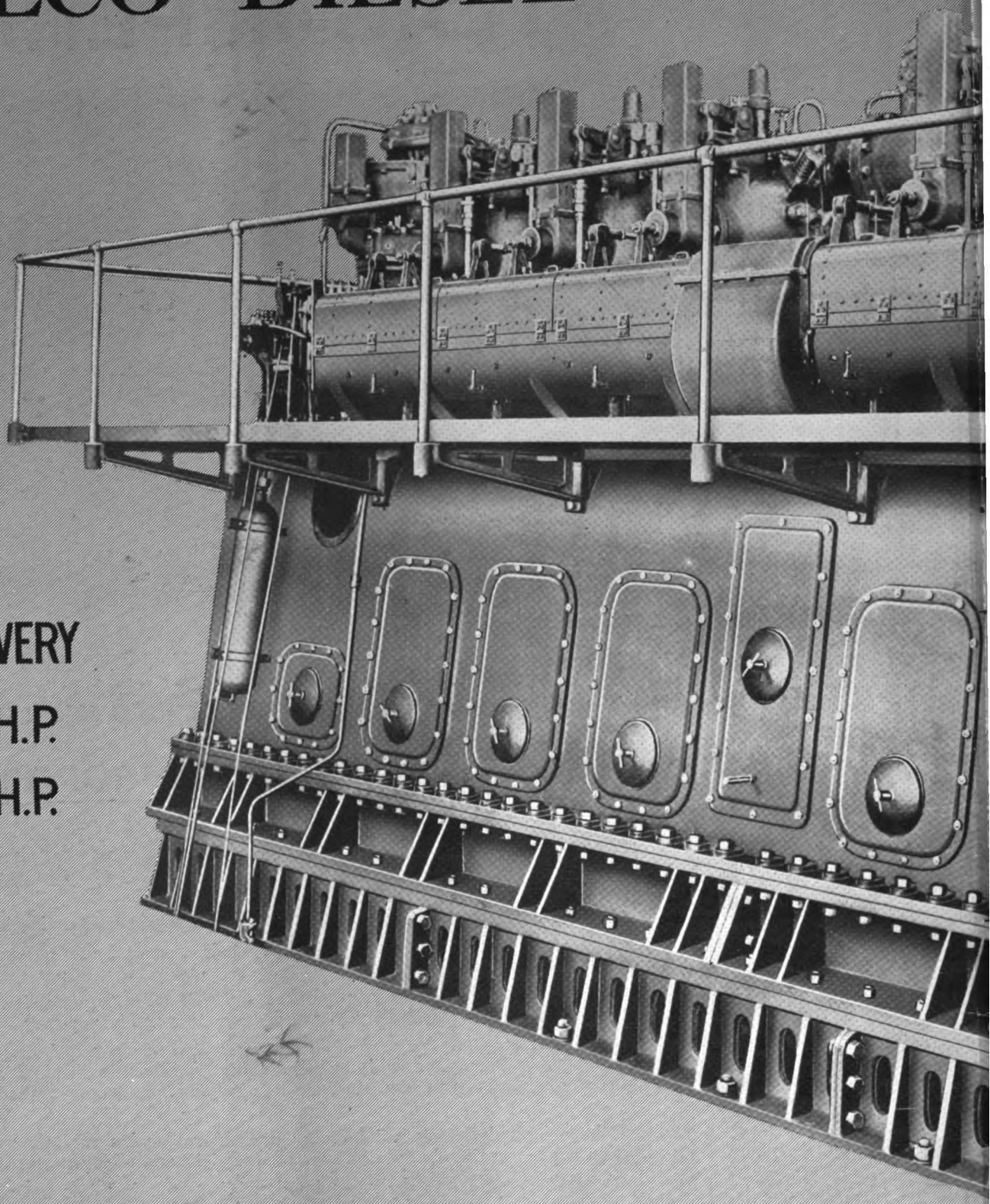
NELSECO DIESEL ENGIN



SIZES
FOR EARLY DELIVERY
120 H.P., 180 H.P.
240 H.P., 360 H.P.
480 H.P.

600-750 B.H.P., 225 R.P.M., 4 cycle, 6 cylinders
HEAVY-DUTY MARINE OR STATIONARY DIESEL ENGINE

NELSECO

New London Ship
Groton,

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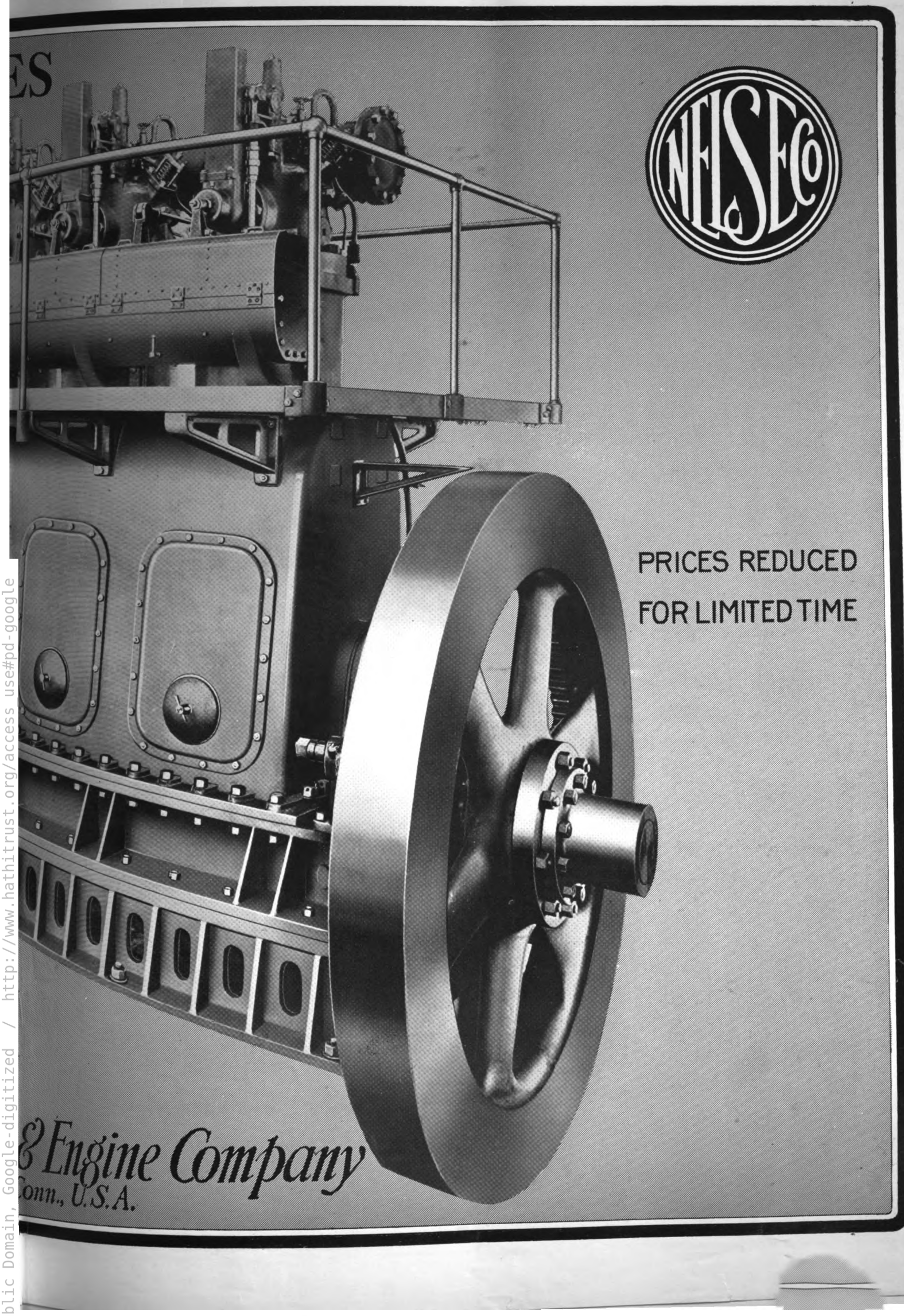

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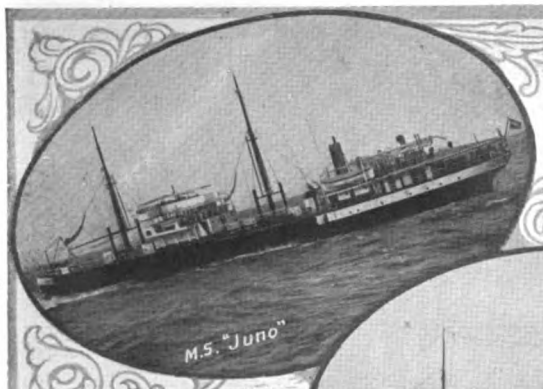
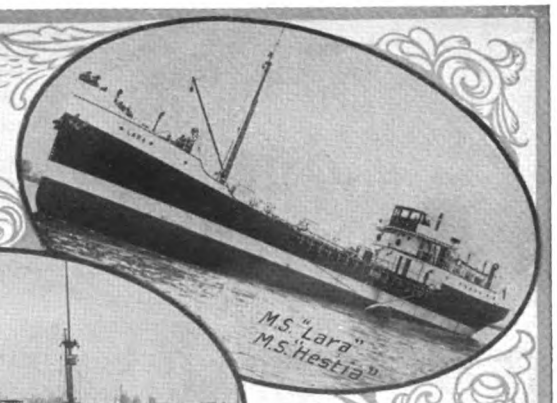
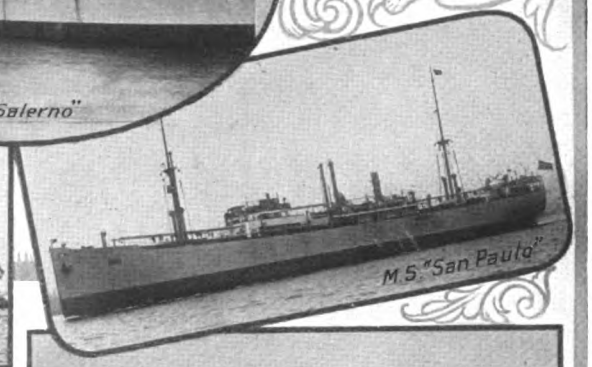
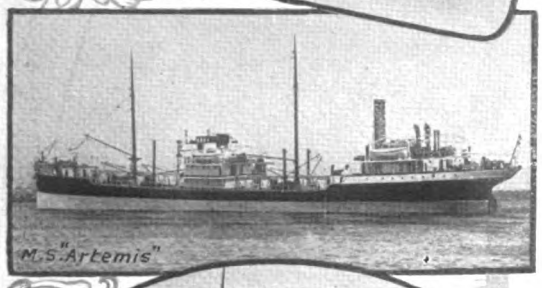
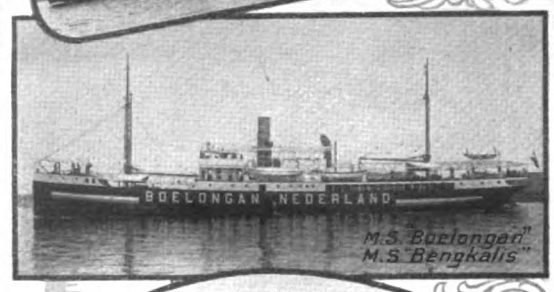
Some WERKSPOOR ENGINED MOTORSHIPS





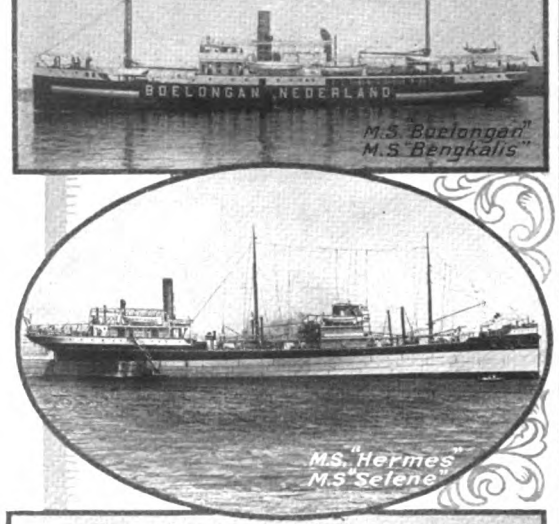






1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800

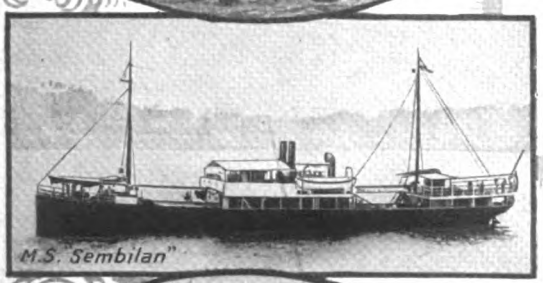


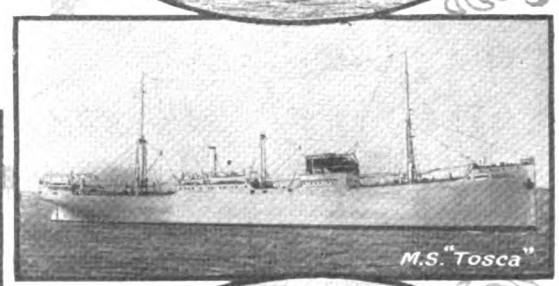
FOUR-CYCLE DIESEL ENGINES

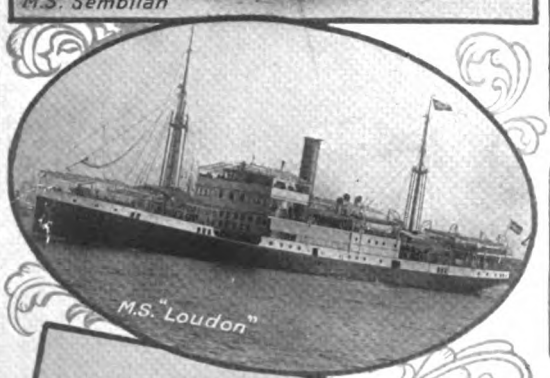
WERKSPOOR

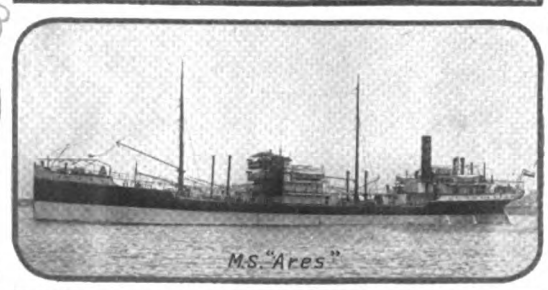
AMSTERDAM - - HOLLAND

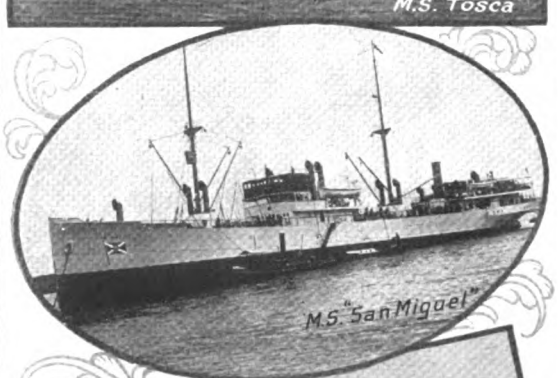
U. S. Representative:
WM. BRAAT
730 Tribune Bldg., N. Y. City

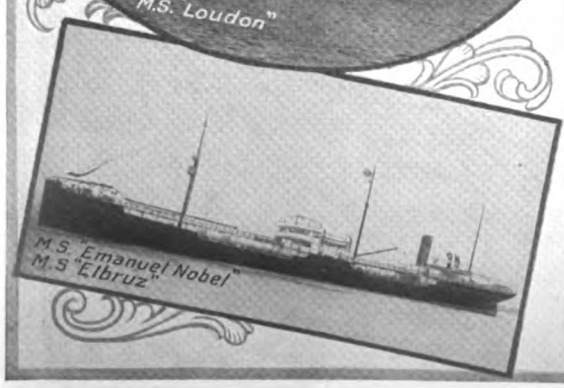


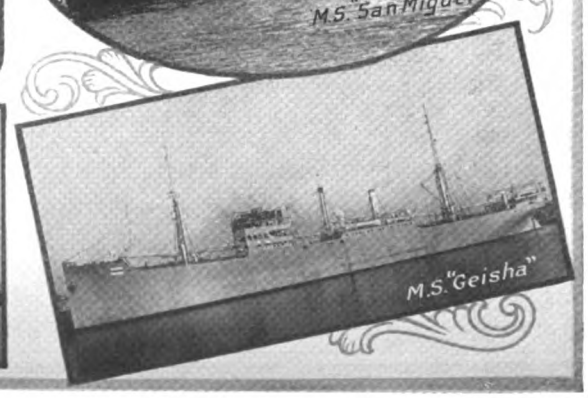












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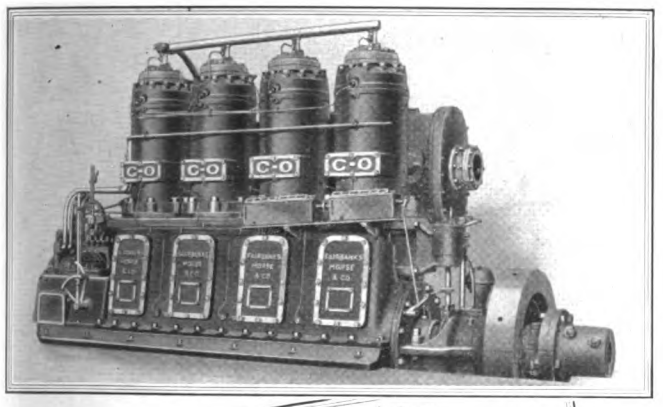
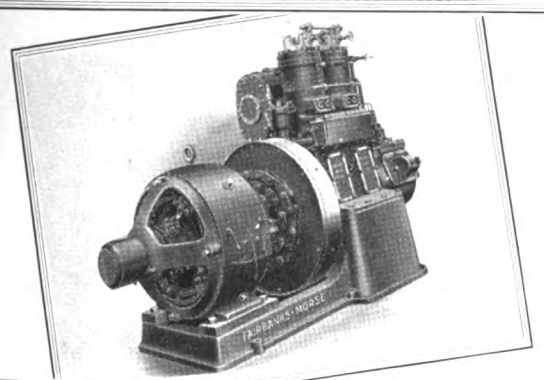
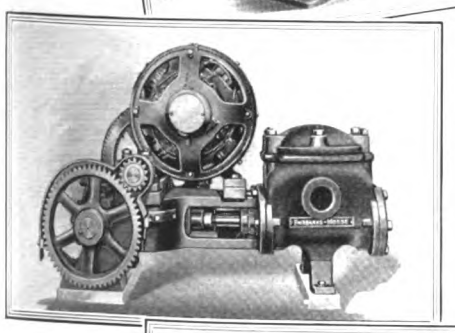
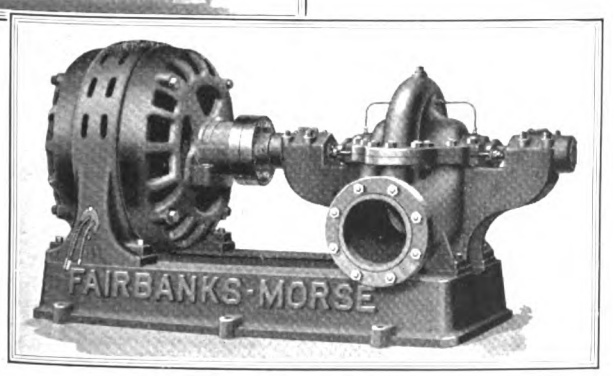
FAIRBANKS-MORSE Marine Equipment









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"C-O" marine oil engines are maintaining the successful performance records they have built up through years of hard service in over one thousand commercial boat installations—tugs, cargo vessels, lighters, ferries, schooners and workboats of every description. "C-O" engines use low grade fuel oils economically.

Generating Sets

Type "C-O" for motor vessels to operate auxiliaries and lighting. Compact and designed for constant duty.

Pumps

Displacement and Centrifugal motor driven marine types suitable for bilge, fire, oil cargo, and general purposes.

Guaranteed Responsibility

The installation of Fairbanks-Morse engines, generators, motors and pumps on your ship provides complete equipment covered by a definite and undivided responsibility.

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MANUFACTURERS CHICAGO

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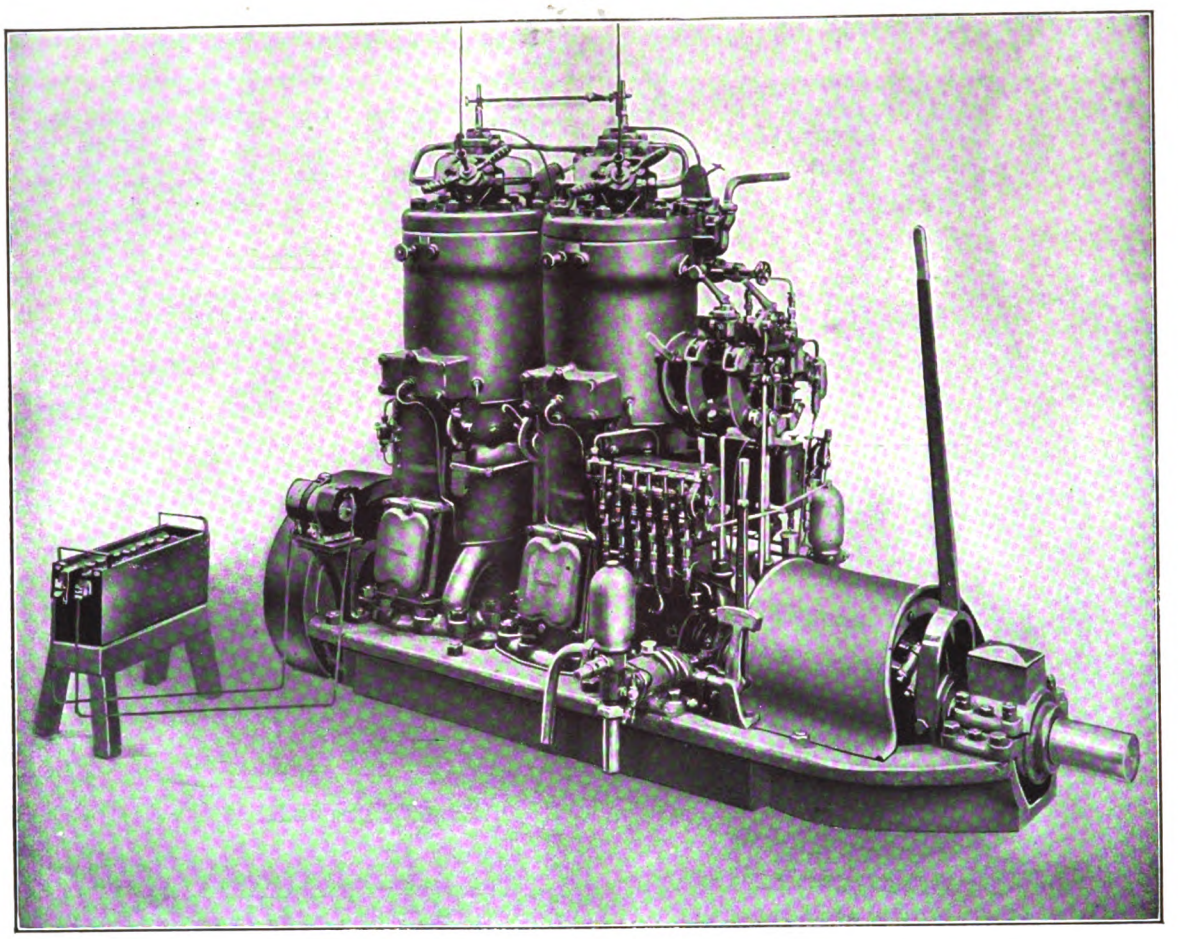
BOLINDERS



Bolinders NEW TYPE Engines are ideal as propulsory power for BARGES.

Here are the reasons:

NEW INJECTION DEVICE—The fuel injection can be adjusted in such a way that the engine is able to run any length of time even without load or with small load. No resorting to external heating devices.

ELECTRIC STARTING DEVICE—The engine can be started from cold condition within 15 seconds. No danger from lamps or kerosene.

NO AIR COMPRESOR—Weight and length of engine reduced, carrying capacity and cargo space increased, simplicity of engine increased.

DIRECT REVERSIBLE—No complicated reverse gears liable to break down, no compressed air liable to give out during frequent manoeuvring.

LOW FUEL CONSUMPTION—i. e., low running costs.

SIMPLICITY OF DESIGN—No difficulty to run a BOLINDERS, even for engineers with small experience in the handling of engines.

COMPACTNESS OF DESIGN—Larger space available for the cargo.

NO WATER INJECTION—No water tanks; space and carrying capacity saved for useful purposes.

HIGHEST CLASS WORKMANSHIP, VERY BEST MATERIALS USED IN THE ENGINES—Long life of engines, low repair costs, low upkeep.

SIZES: 10—500 B.H.P.

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BOLINDERS COMPANY, 411 Exchange Building, 53 State Street, BOSTON, MASS.

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HAVANA, CUBA

COMPAÑIA BOLINDER
Avenida de Mayo 560
BUENOS AIRES, ARGENTINA

CARIB TRADING CO.
CARTAGENA, COLOMBIA

BOLINDER'S COMPANY · J&G · TRADE MARK · NEW YORK U.S.A.

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ALEXANDER McDOUGALL
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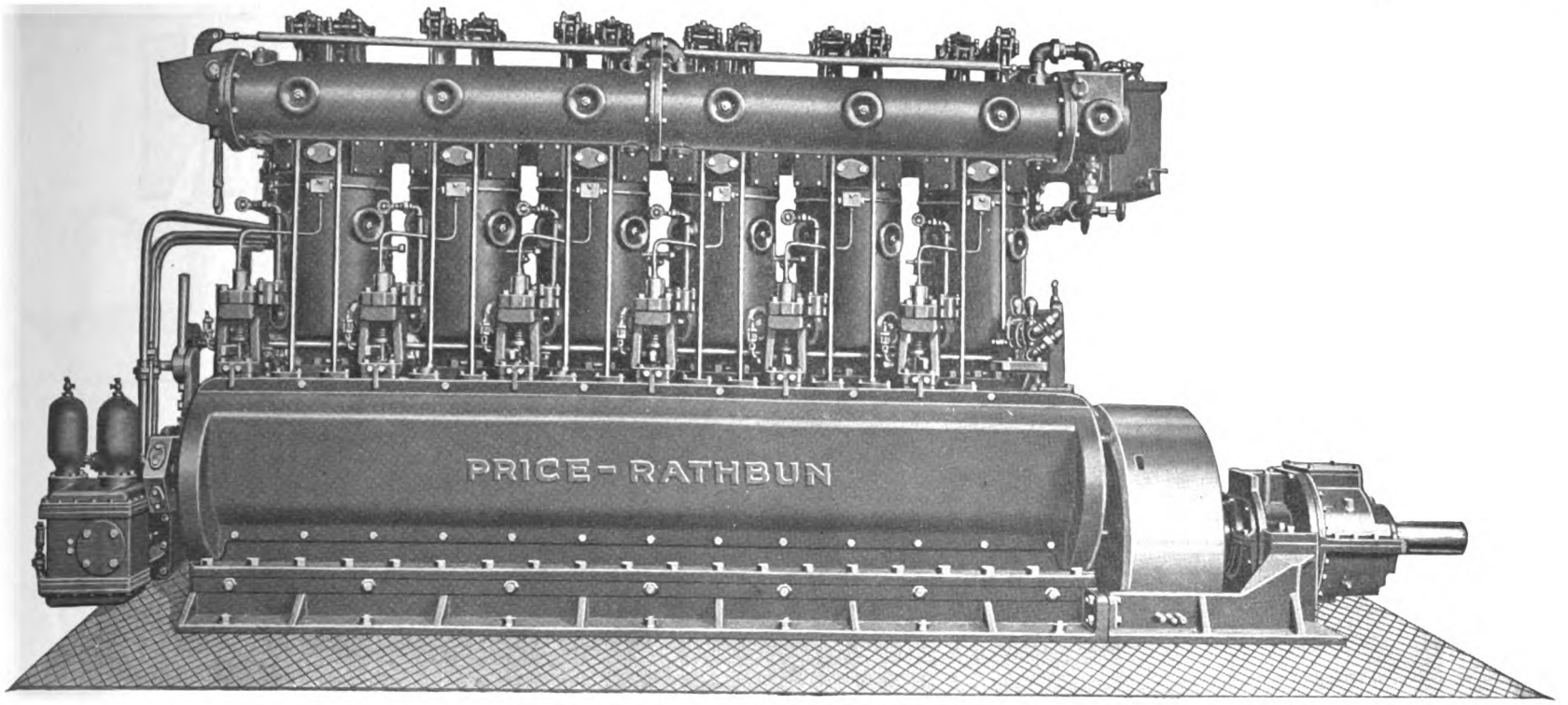

The Test of Comparison

In most cases any oil engine must compete with steam engine or turbine drive and stand the test of engineering comparison.

Compare the Price Oil Engine with other types of drive from the following three angles:

Cost of prime mover and necessary auxiliaries.
Consumption and cost of fuel and lubrication.
Cost of attendance and upkeep.

Price Oil Engines have direct-injection of fuel without the use of compressed air. The elimination of the high-pressure injection air compressor increases the engine's mechanical efficiency and materially reduces the possibility of breakdown.

Ignition is by heat of compression only—there are no hot bulbs, plates or liners.

The guaranteed fuel oil consumption of Price Engines is 0.45 pounds per brake horse power hour. The guaranteed lubricating oil consumption is one gallon per 4000 brake horse power hours.

The selection of materials and the conservative design and rating of Price Engines insure long life and freedom from breakdown.

PRICE OIL ENGINES

Bulletin 10102 tells the complete story. Send for your copy and subject Price Engines to the test of comparison.

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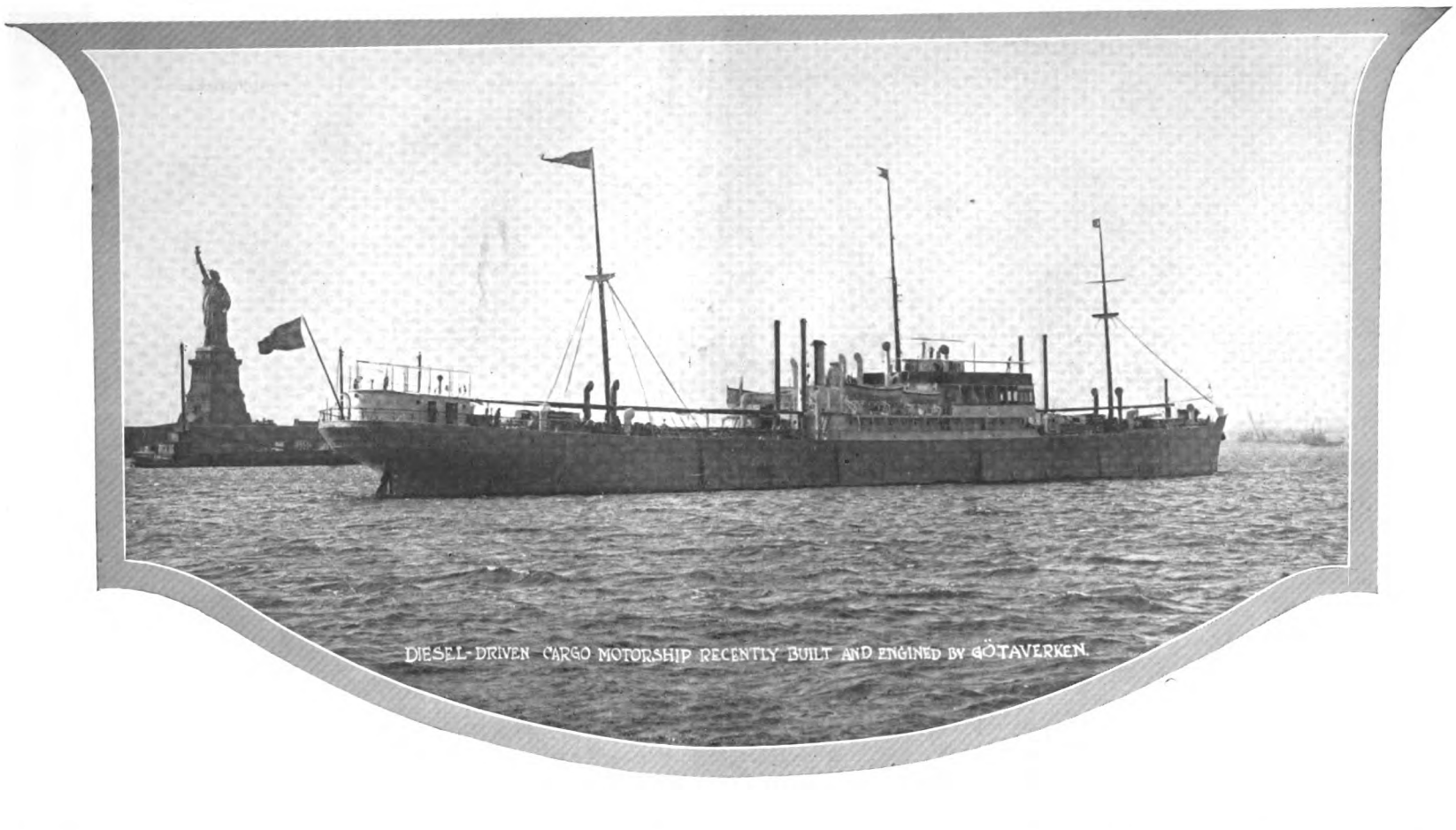

DIESEL-DRIVEN CARGO MOTORSHIP RECENTLY BUILT AND ENGINED BY GÖTAVERKEN.

SHIPBUILDERS, ENGINEERS AND SPECIALISTS IN THE REPAIR OF MOTORSHIPS, STEAMSHIPS AND THEIR RESPECTIVE MACHINERY

TWELVE GÖTAVERKEN-BUILT MOTORSHIPS IN SERVICE, AGGREGATING 99,450 TONS D.W. AND 37,400 I.H.P., ALSO ONE DIESEL-DRIVEN SALVAGE-VESSEL OF 1,250 I.H.P. IF YOUR MOTORSHIPS NEED REPAIR IN EUROPEAN WATERS, SEND THEM TO OUR YARD IN PREFERENCE TO A PLANT THAT HAS HAD LITTLE OR NO EXPERIENCE WITH THE CONSTRUCTION OF HIGH-POWERED DIESEL-ENGINED MOTORSHIPS. WE HAVE BUILT SUCCESSFUL STEEL MOTORSHIPS OF LARGE SIZE UP TO 14 KNOTS SPEED. OUR LARGE FOUNDRY CAN SUPPLY DIESEL-ENGINE CASTINGS TO ORDER.

CONSTRUCTIONAL LICENSEES IN SWEDEN OF THE BURMEISTER & WAIN DIESEL MARINE OIL-ENGINE

DIESEL ENGINE WORKS

SHIPYARD—FOUNDRY

FLOATING DRY-DOCK WITH A LIFTING CAPACITY OF 12,000 TONS

POSTAL AND TELEGRAPHIC ADDRESS

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Marine, Stationary, Four-Cycle, Two-Cycle

High-Speed, Low-Speed, Light-Weight
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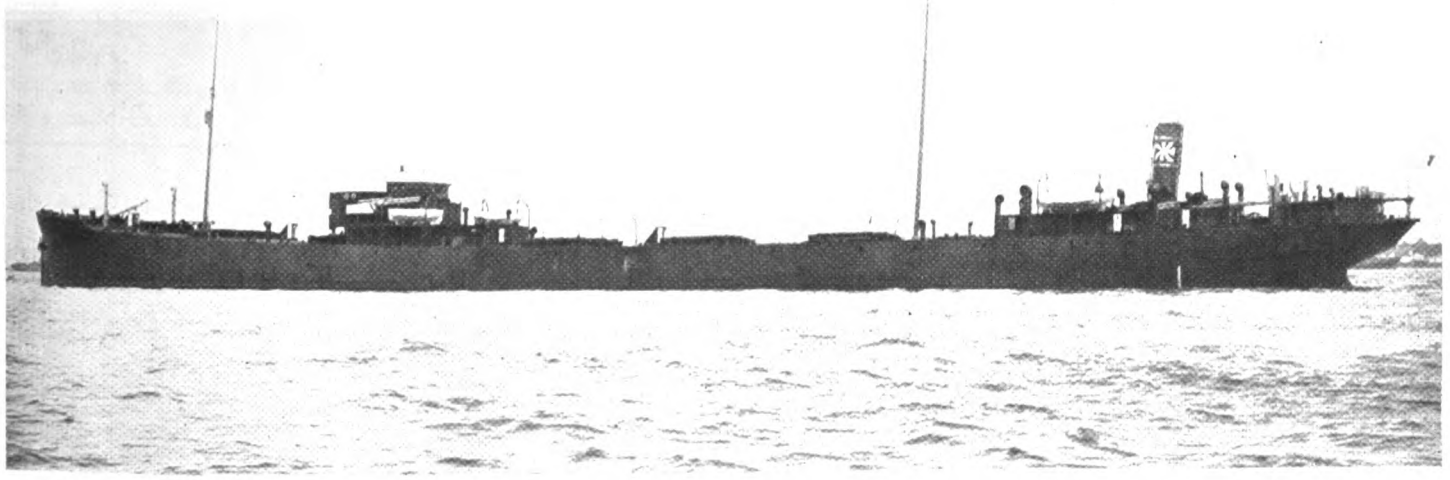
Direct-Drive Electric-Drive

All Sizes, 45 to 10,000 B.H.P. in One Unit



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Capacity 119,700 Barrels Oil
Mean Light Sea Speed 11.64 Knots
Mean Loaded Sea Speed 10.64 Knots
Daily Fuel Consumption 14 Tons

Uninterrupted Operation 18 Months

AMERICAN KRUPP-SYSTEM DIESEL ENGINE CO.

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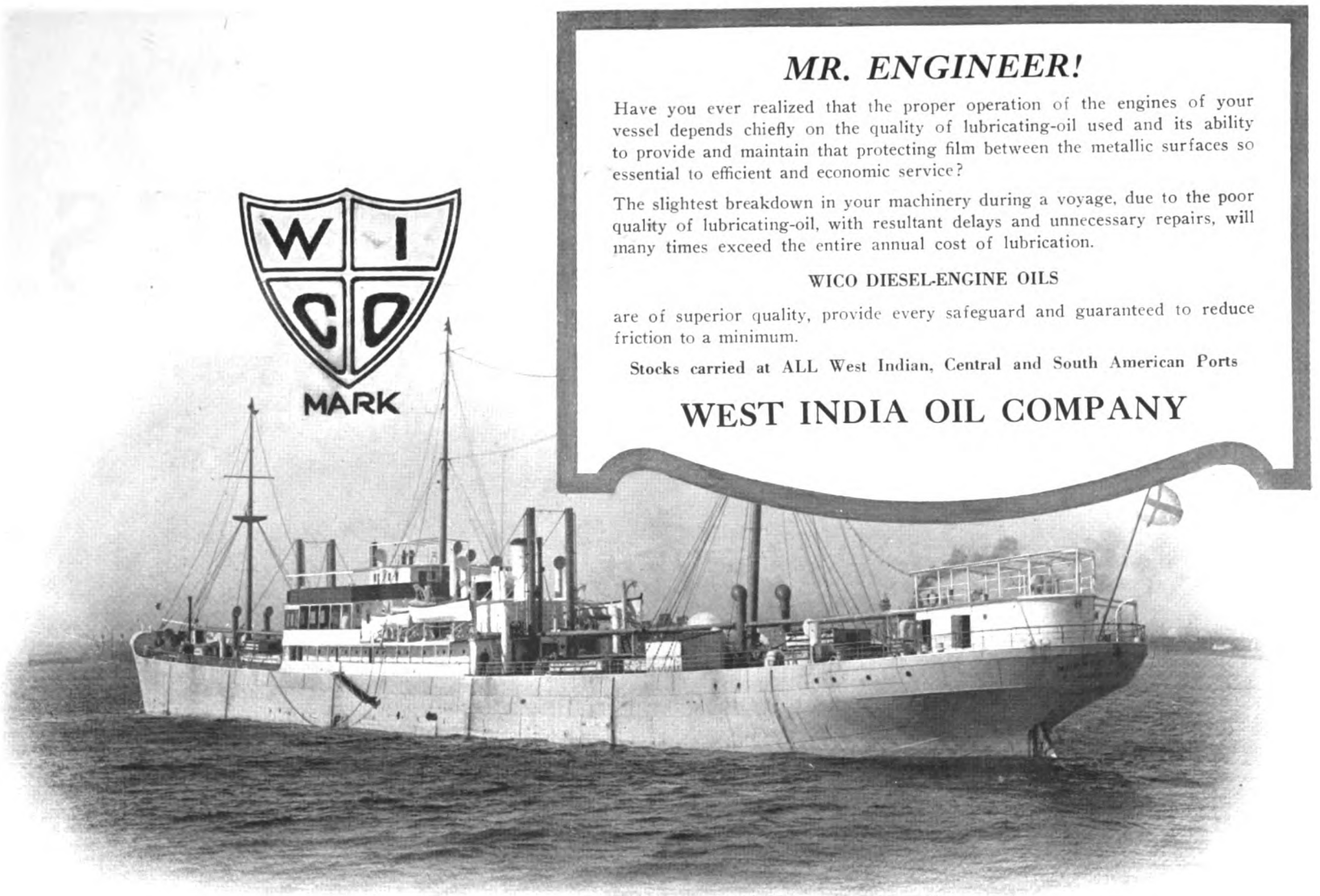

MR. ENGINEER!

Have you ever realized that the proper operation of the engines of your vessel depends chiefly on the quality of lubricating-oil used and its ability to provide and maintain that protecting film between the metallic surfaces so essential to efficient and economic service?

The slightest breakdown in your machinery during a voyage, due to the poor quality of lubricating-oil, with resultant delays and unnecessary repairs, will many times exceed the entire annual cost of lubrication.

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are of superior quality, provide every safeguard and guaranteed to reduce friction to a minimum.

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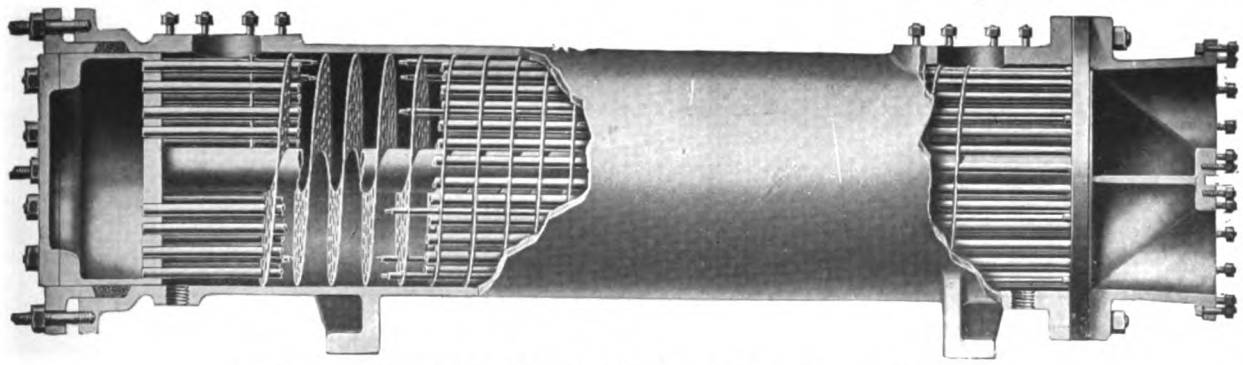
"the long, smooth oil path!"



MULTIWHIRL COOLER

For Cooling Piston and Bearing Oil in Diesel Engines

For the General Cooling of Lubricating Oils

CONSTRUCTION

Oil in shell—cooling water in tubes—entire tube bundle removable.

Helical Baffle—long, smooth oil path—minimum pressure drop.

Tubes expanded into tube plates—no sweated joints.

Outside packed floating head—no expansion strain—no internal joints—impossible for water to leak into oil.

Extreme compactness due to high rate of heat transfer.

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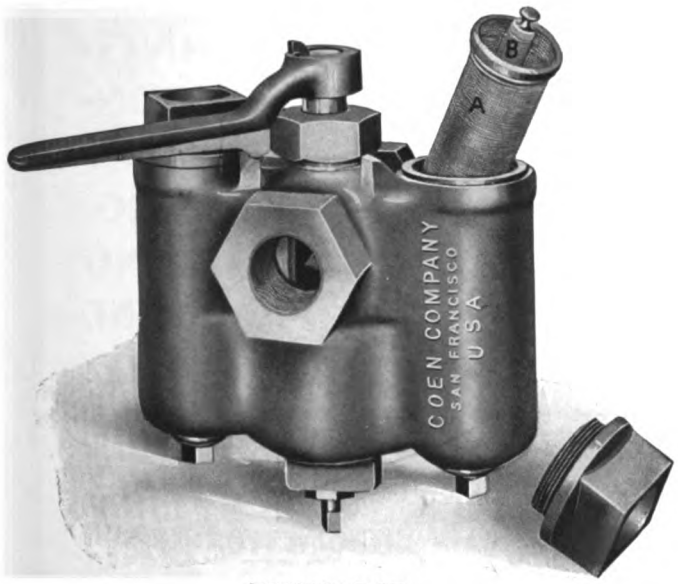
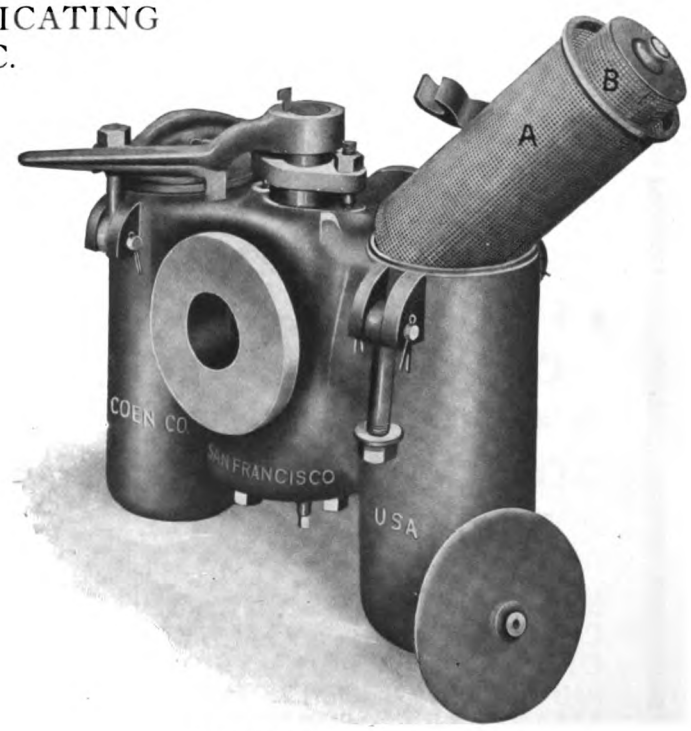
"COEN" DUPLEX STRAINER

FOR

FUEL AND LUBRICATING OILS, ETC.



DISCHARGE



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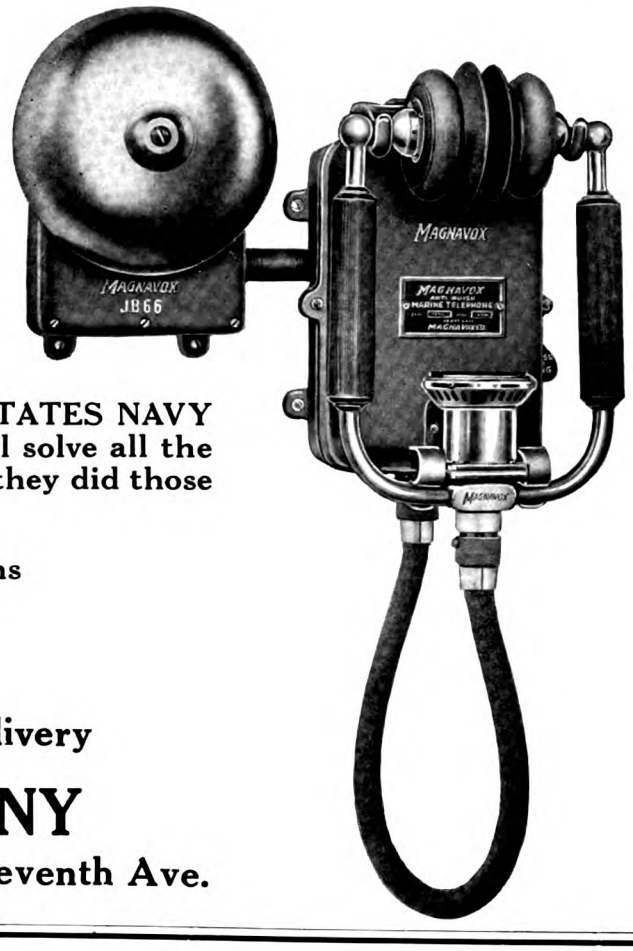
PERFECT COMMUNICATION

BY TELEPHONE

BETWEEN BRIDGE AND ENGINE ROOM NO MATTER HOW NOISY



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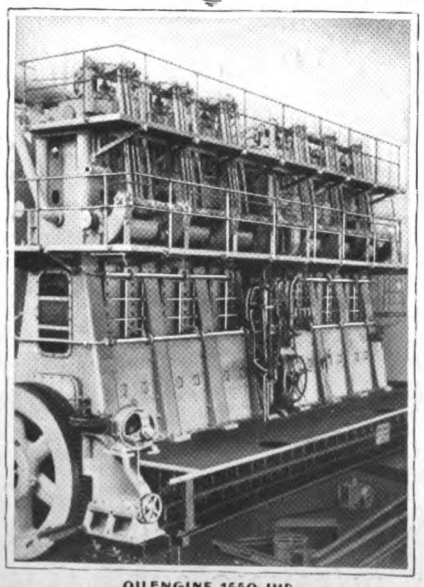

OILENGINE 1550 IHP
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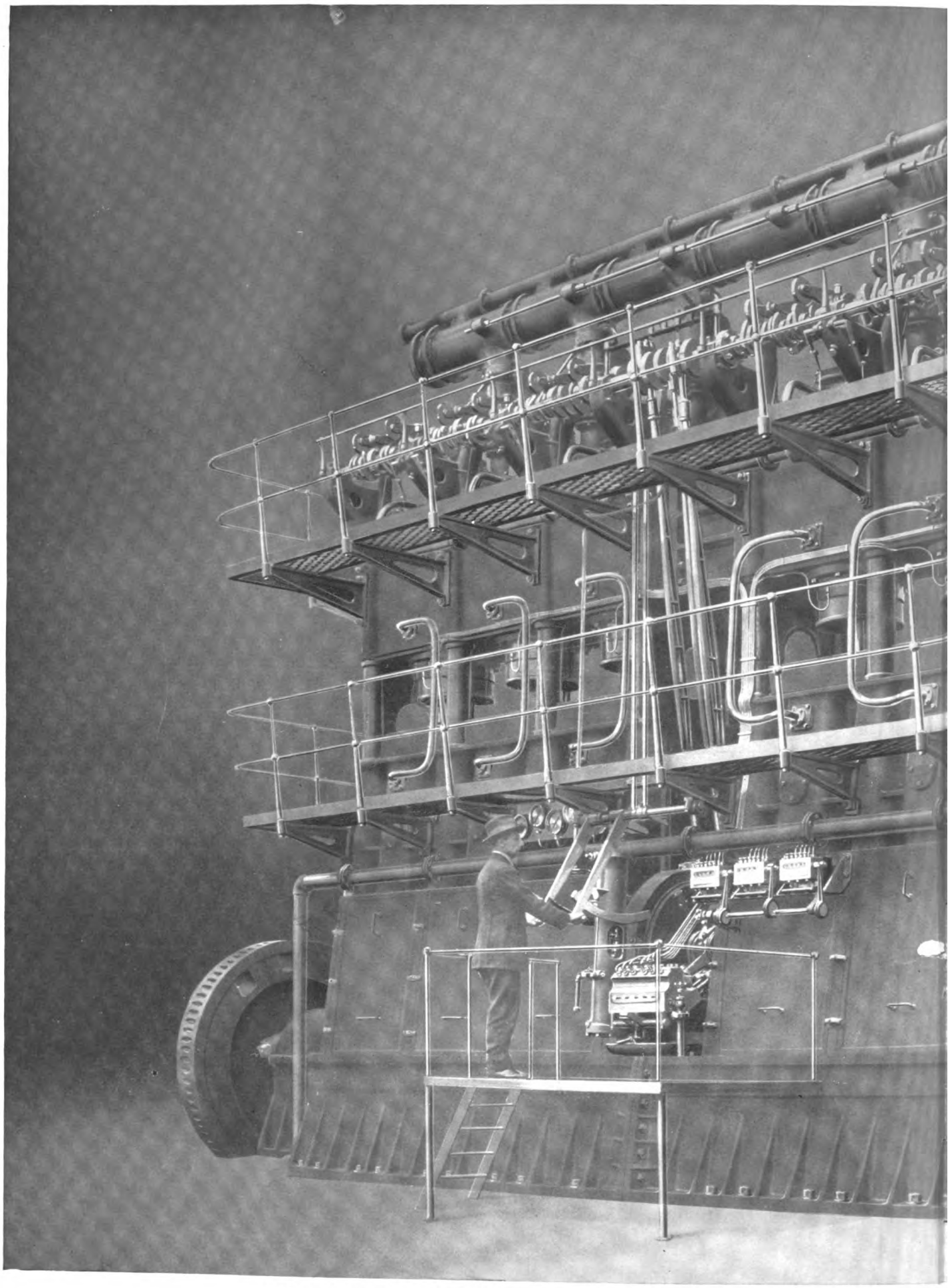

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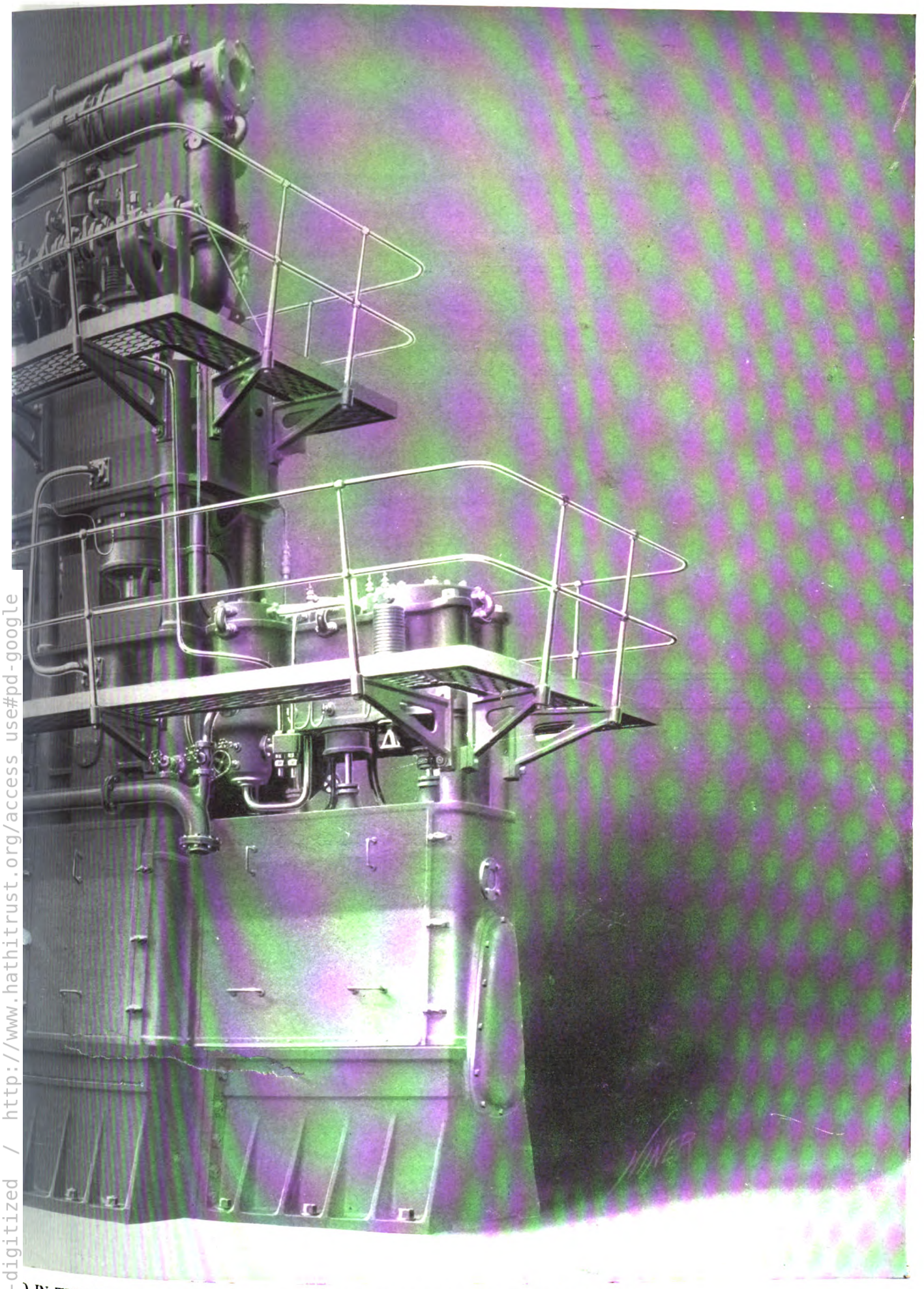

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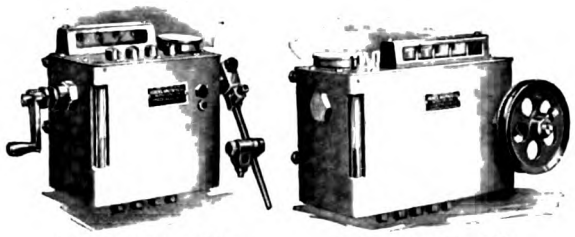

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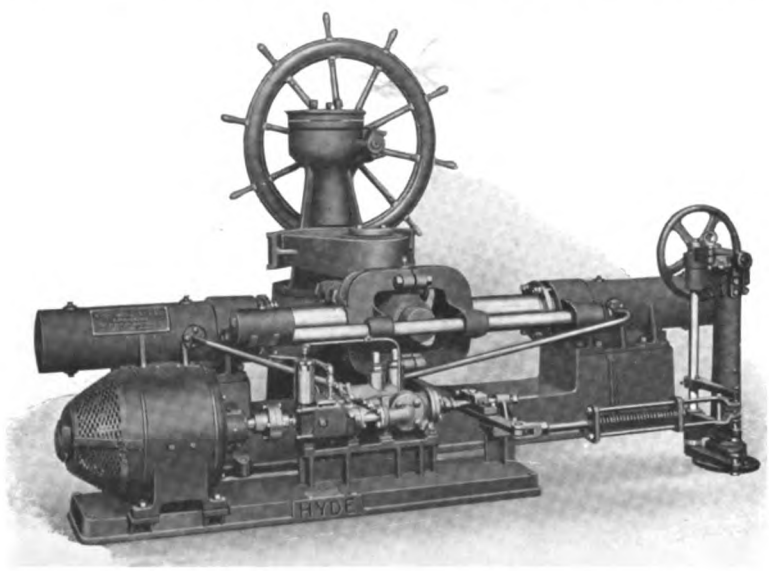

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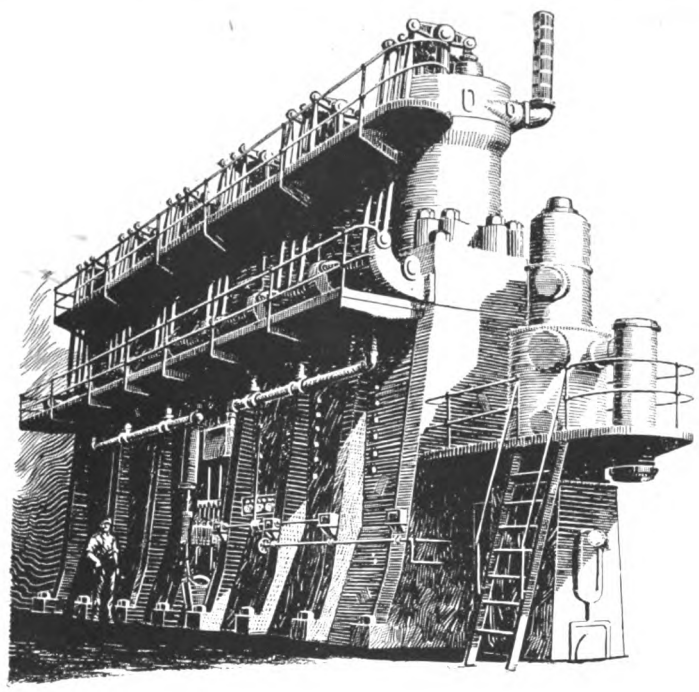

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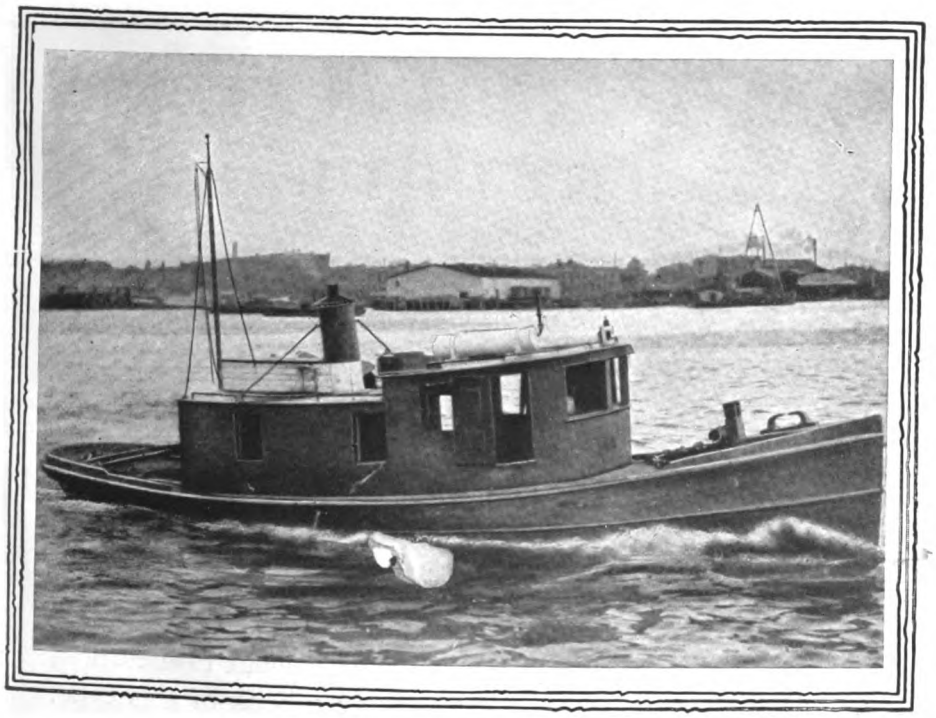

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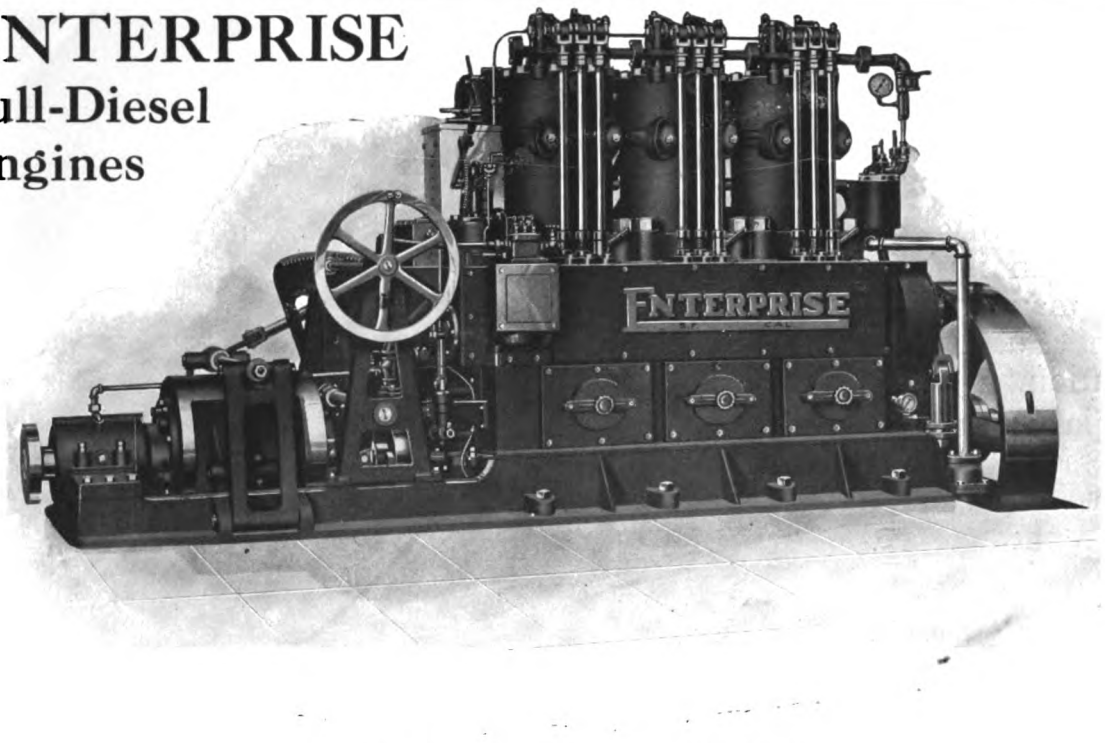

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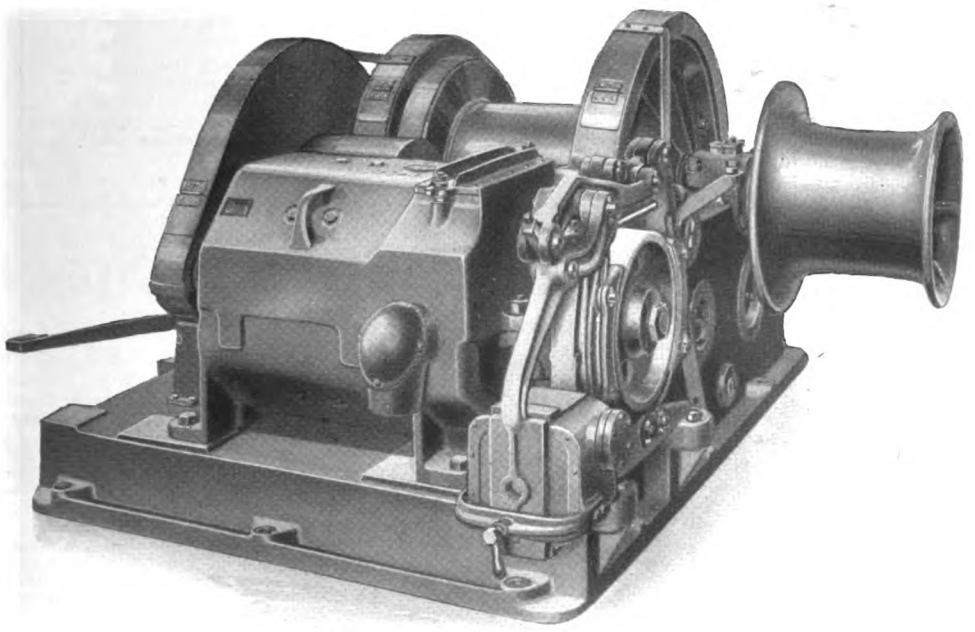

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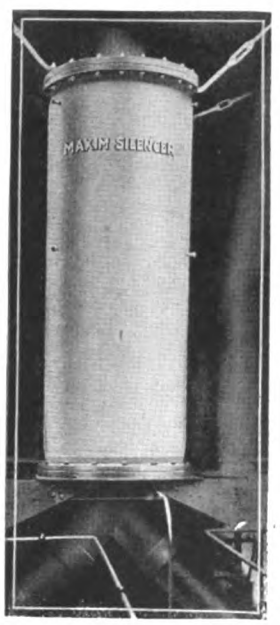

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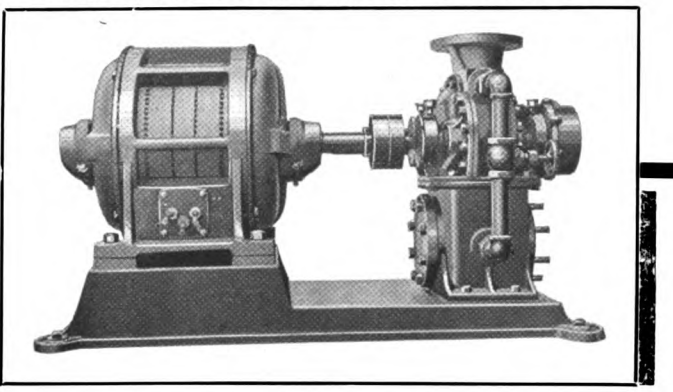

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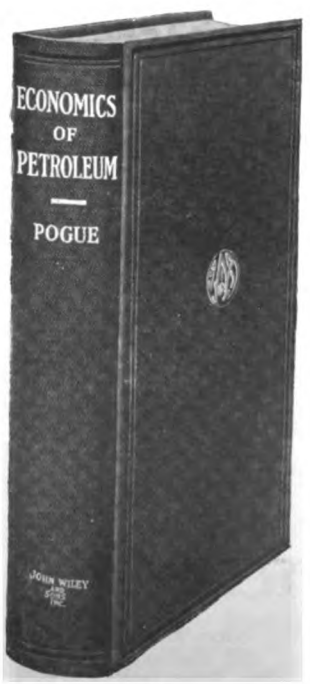

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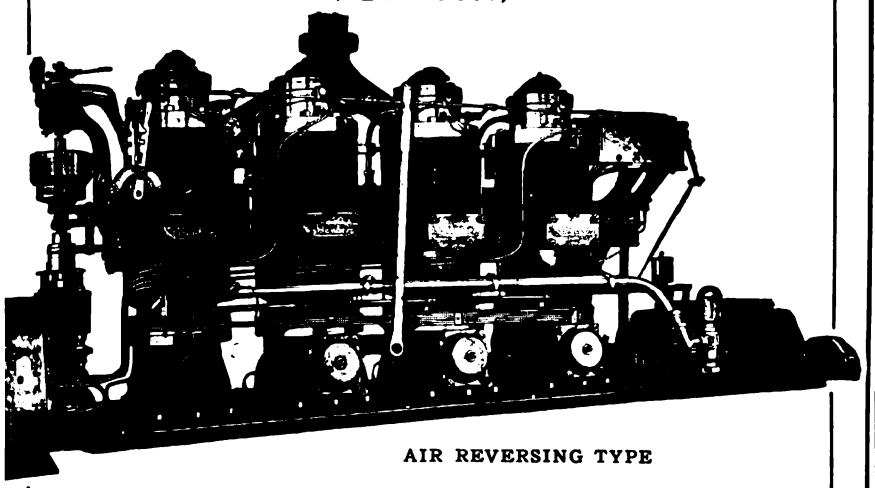

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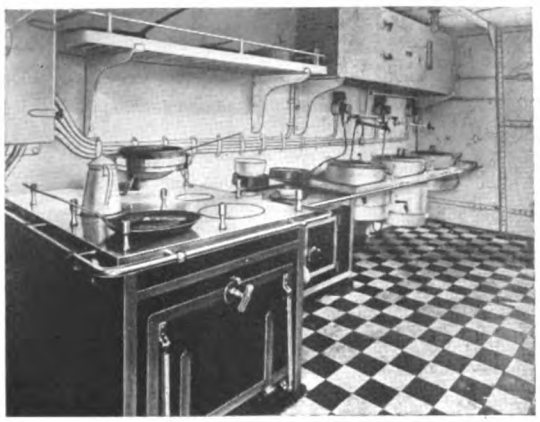

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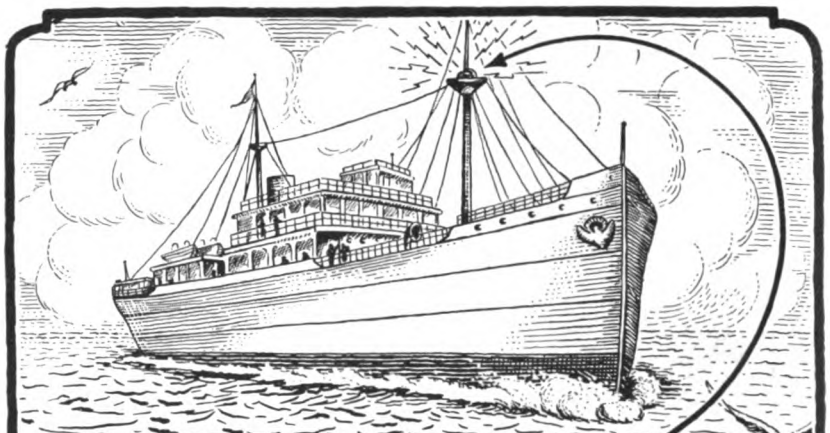

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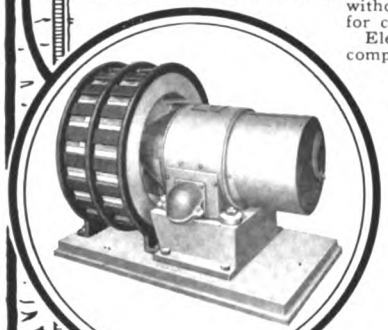

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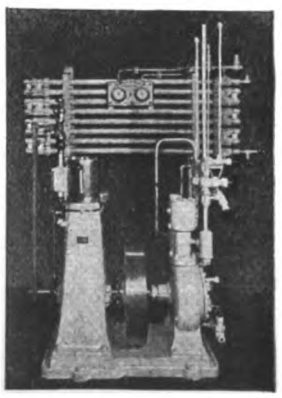

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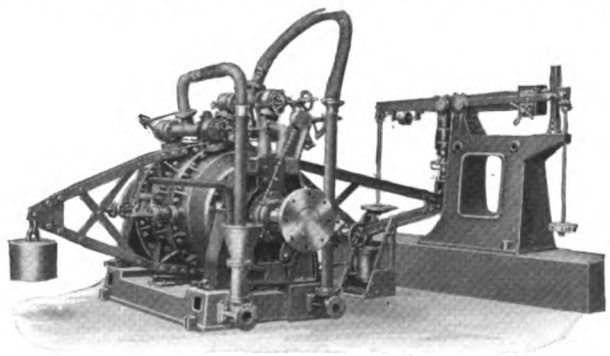

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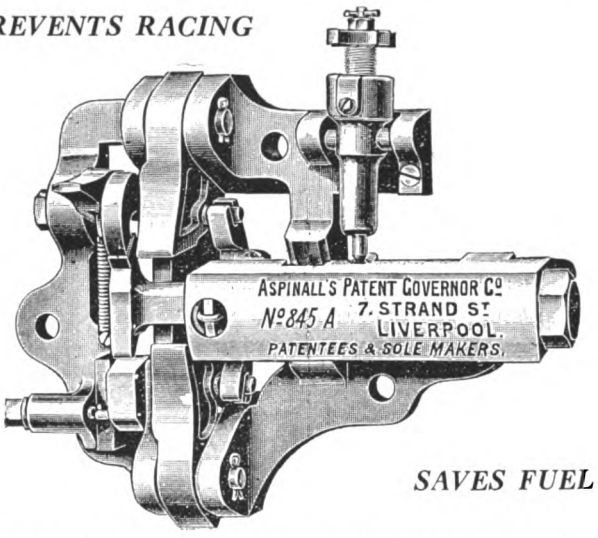
INTERNAL-COMBUSTION OIL-ENGINES

PREVENTS RACING



SAVES FUEL

Adopted By the Leading Builders at Home and Abroad
Fitted to a large Number of Ocean Going Motor Vessels

For Full Particulars Apply to

ASPINALL'S PATENT GOVERNOR CO.
10 STRAND STREET, LIVERPOOL
Telegrams—"VELO," LIVERPOOL
Telephones—BANK { 3731 / 4484

Agents in U. S. America
PLANT RUBBER & ASBESTOS WORKS
537 Brannan Street, San Francisco

JOHN PLATT & CO.
2 Rector Street, New York

The M.S. "POLSTJERNAN" Fitted with one 200 b.h.p. BERGSUND" Oil-Engine

"BERGSUND"
CRUDE OIL ENGINES

FROM 5 b.h.p. UP TO 600 b.h.p.

DIRECT REVERSING

BERGSUNDS MEKANISKA VERKSTADS A.B.

Shipbuilders and Engineers

STOCKHOLM **SWEDEN**

Cable Address: BERGSUND, STOCKHOLM

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Economy In The Motorship

TODAY is always putting yesterday on trial. The saving of fuel is our great argument in favor of the motorship, because it permits of larger cargo space, fewer idle days in port, and greater efficiency in operation.

The Merchant Shipbuilding Corporation recently launched two 11,000 d.w.t. motorships, the CALIFORNIAN and MISSOURIAN. The construction of these ships is acknowledged by shipbuilding experts as of the very best.

Ask us to bid on the following:

SHIP CONSTRUCTION

Designs ready for Tankers of 10,000 d.w.t.
All kinds of Ships up to 15,000 d.w.t.
Motorships 11,500 d.w.t. with Diesel Engines.
Conversion of Steamships to Diesel Motor ships with Direct or Electric Drive.
Repairs and Reconditioning of Ships.

MERCHANT
SHIPBUILDING CORPORATION
Chester, Pa., or 39 Broadway, New York

SHIPBUILDERS

FOR

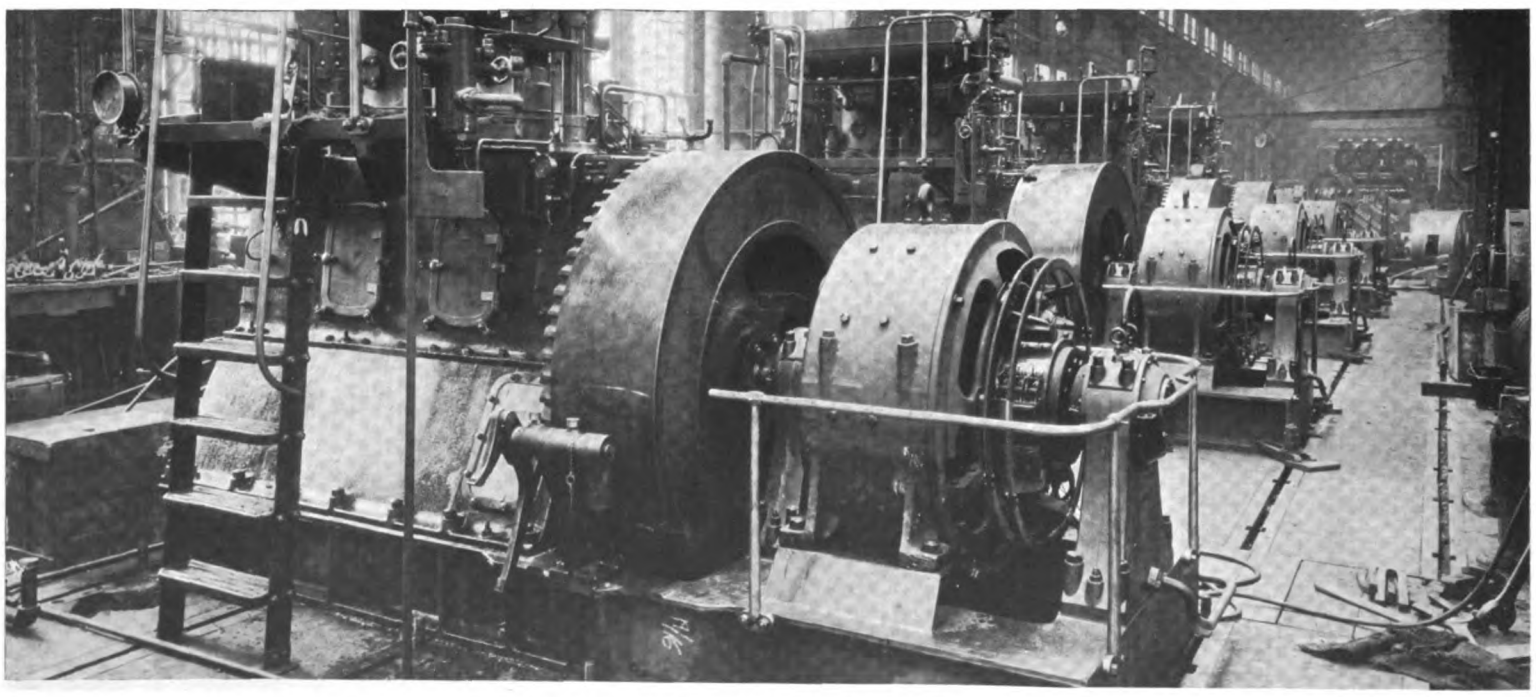
IRON BARK
GUM
HEAVY OAK
LIGNUM VITAE

CONSULT THE

EHRLICH-HARRISON COMPANY

HARDWOOD SPECIALTIES

35 HANFORD ST.
SEATTLE, WASH.



Diesel-Engine Generating Sets for Motorships

The equipment pictured above represents the generating units for the American Hawaiian S.S. Co.'s new Motorships. Each set consists of a Cramp B. & W. Engine coupled to a Diehl Electric Generator of the open Heavy-Duty Type. Diehl Generators are arranged for forced-feed lubrication.

DIEHL MFG. CO., ELIZABETH, N. J., U. S. A.

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—and at Cape Town

AMBITIOUS plans are being made here to take care of a largely increased volume of shipping.

No matter how many motorships may call at Cape Town, Correct Lubricating Oils can be supplied for every engine need.

Gargoyle D. T. E. Oils give unusual results on Diesel type engines. They minimize abrasion and corrosion. They resist emulsification. They separate readily from water and other impurities.

There are in fact some motorships which, after several years, still use the original charge of D. T. E. Oils with little "make-up" added.

Send for the booklet "Gargoyle D. T. E. Oils." It contains valuable information on the various uses of these oils as related to the lubrication of Diesel type engines.

GARGOYLE

Marine Oils

A grade for each type of service

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* **NEW YORK, U.S.A.**

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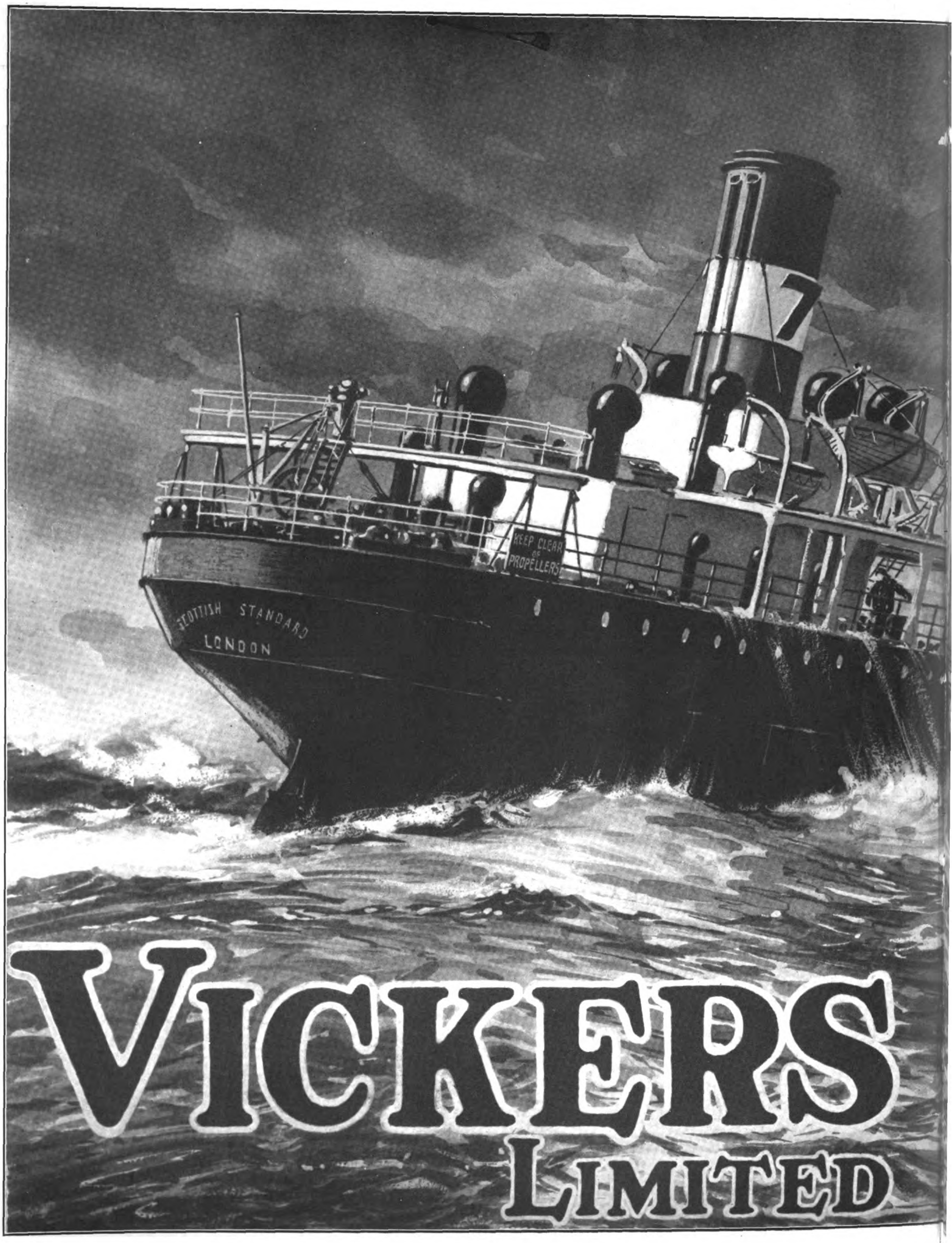

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MARINE OIL ENGINES

Specially designed for Mercantile-Marine use. Rugged, Rigid, Simple and Accessible. No Injection—Air Compressor. Rating conservative and quoted in Brake Horse-Power. Guaranteed for continuous running. The design embodies the experience of Marine Engines totalling half-a-million horse-power.

Works: Barrow-in-Furness, England

Head Offices: Vickers House, Broadway, London, S. W. I.

New York Office: 2550 Woolworth Building, 233 Broadway

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McINTOSH & SEYMOUR CORPORATION

AUBURN, N. Y., U. S. A.

Have Furnished Heavy-Duty Diesel Marine Engines for the Following Ships

Name of Vessel	Dead Weight Tonnage
CETHANA	3300
ISLA DE JAVA	4100
CHALLAMBA	3300
CULBURRA	3300
COCHINCHINE	2500
BAYONNE	1500
COOLCHA	3300
SOLITAIRE	5000
BENOWA	4400
BALCATTA	4400
BABINDA	4400
BOOBYALLA	4400
BORRIKA	4400
MARYLAND	4500
TEXACO No. 146	1000
TEXACO No. 147	1000
J. F. PENROSE	4500
BRAMELL POINT	5000
ASTMAHCO No. 3	3000
ASTMAHCO No. 4	3000
BACOI	2500
CAROLYN FRANCES	1000
DONNA LANE	3300
KENNECOTT	6500

LOOK UP THESE VESSELS WHEN THEY ARE IN PORT

MAIN OFFICE AND WORKS

AUBURN, N. Y., U. S. A.

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New York City

700 INTERSTATE BLDG.
Kansas City, Mo.

815 SHELDON BLDG.
San Francisco, Calif.

412 DALLAS COUNTY STATE BANK BLDG.
Dallas, Texas

412 BISBEE BLDG.
Jacksonville, Fla.

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A Few Words by Our Business Department to Marine Equipment Manufacturers

Contrasting with the present unprecedented slump in *steam*-driven cargo-ship construction (which offers few near-future prospects) the merchant motorship and oil-engined work-boat industries today have brighter indications than at any previous period.

One of "Motorship's" advertisers manufacturing deck-equipment reports that during a recent month bona-fide enquiries for equipment totalling $1,117,000 were received.

Reference to the Editorial section of this and the last few numbers of "Motorship," shows a number of domestic contracts just placed, and many more nearly ready to be signed. But there is almost a dearth of steam-freighter orders.

According to Lloyd's report just issued the number of motorships launched during 1921 shows an excess of 116,645 tons gross (186,000 tons dead-weight) over 1920, but turbine-steamship construction showed a drop of 630,000 tons gross during the same period.

This means that Marine-Equipment Manufacturers must turn to the Diesel and Diesel-electric motorship and oil-engine work-boat fields for their main market both now and during the next few years.

ADVERTISE IN THE ONLY MAGAZINE DEVOTED EXCLUSIVELY TO THESE ACTIVE MARKETS

MOTORSHIP

282 West 25th Street, New York City, U. S. A.

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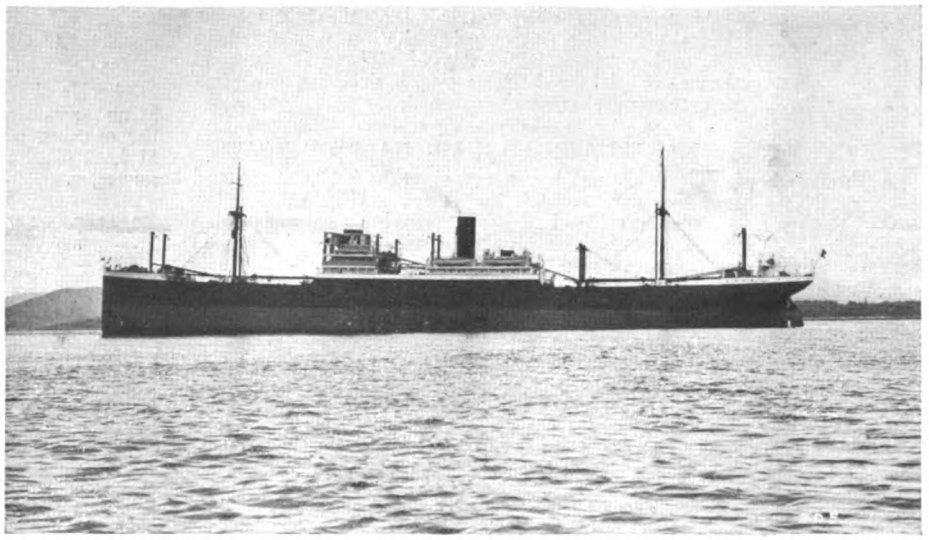
HARLAND & WOLFF LTD

Shipbuilding and Engineering Works

BELFAST ◎ GLASGOW ◎ GREENOCK

M. S. "Glenogle"
Deadweight Capacity
12,300 Tons



Built for the Glen Line

Diesel Engine Works, FINNIESTON & SCOTSTOUN, GLASGOW

Repair Works, LIVERPOOL AND SOUTHAMPTON

London Office, 1a Cockspur St., S. W.

LAST CALL FOR YOUR

ADVERTISEMENT IN THE

1922

MOTORSHIP YEAR BOOK

The editorial section of this valuable work is practically completed, and printing of the Year Book will be commenced shortly after issuance of the March number of *Motorship*. There is just time to reserve space for your advertisement. Telephone or telegraph now.

That the 1921 Year-Book was entirely sold-out in six weeks, and that hundreds of copies of the 1922 Edition already have been ordered in advance, should convince advertisers of its wonderful publicity value.

The publishers of "Motorship" stand at the back of this Year-Book and guarantee that it will be more interesting and useful than the excellent 1921 edition, which was the first attempt at a book of this type.

SEND YOUR ORDER NOW AND AVOID DISAPPOINTMENT
TO "PASS IT UP" WILL BE FALSE ECONOMY

MILLER FREEMAN & CO.
Publishers of
MOTORSHIP
282 West 25th Street
New York City

TELEPHONE, WATKINS 9848 CABLES, FREEMOTE, NEW YORK, U. S. A.

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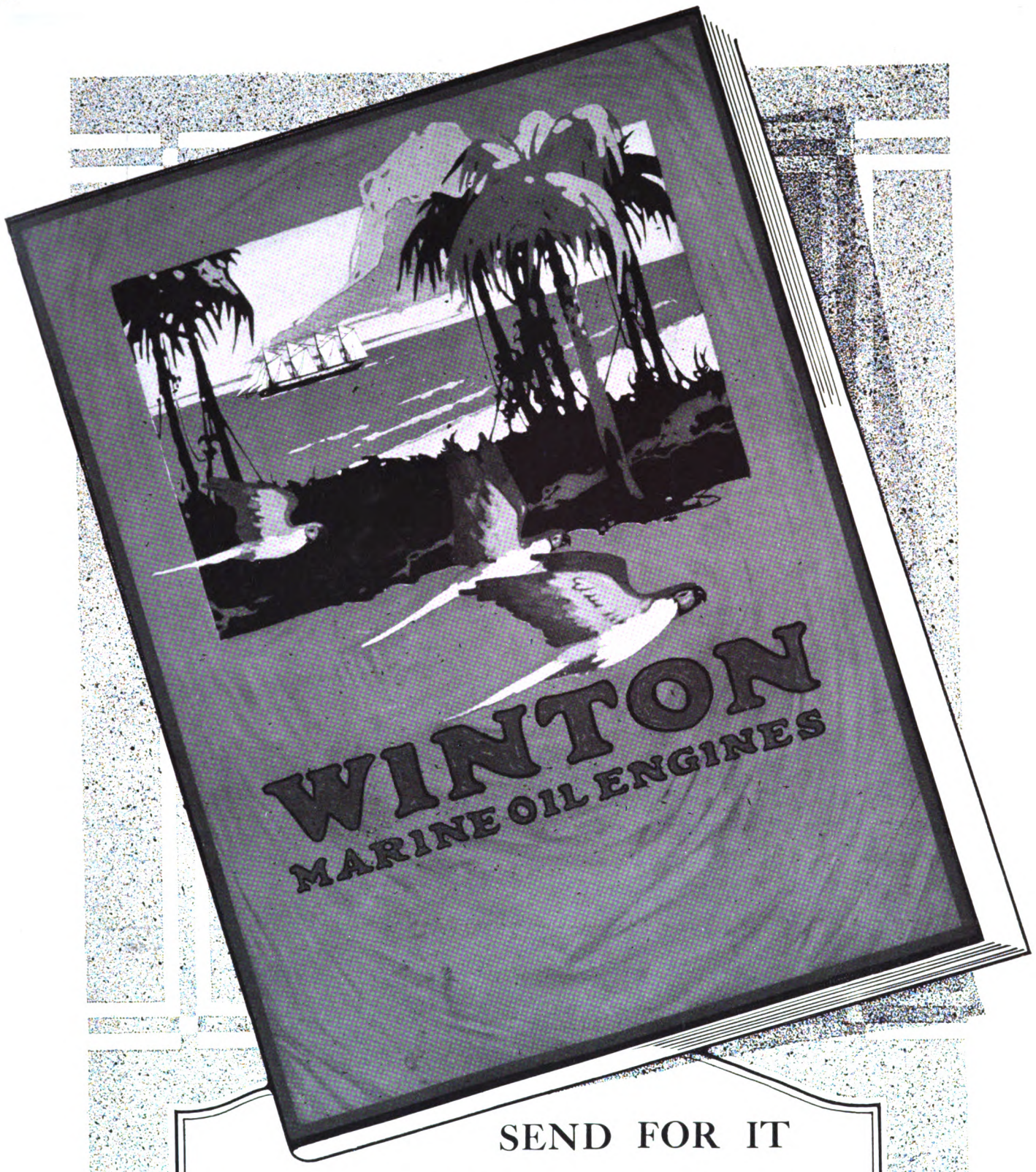

SEND FOR IT

The new Winton Oil Engine Catalog will be sent to any naval architect, ship builder or ship owner who requests it on his own letter head. We want every buyer of oil engines to have one.

WINTON ENGINE WORKS,

***New York*—A. G. Griese, Inc., 30 Church St.** ***Seattle*—H. W. Starrett, Sunset Engine Co.**
***Washington, D. C.*—R. L. Fryer, 817 Albee Bldg.**

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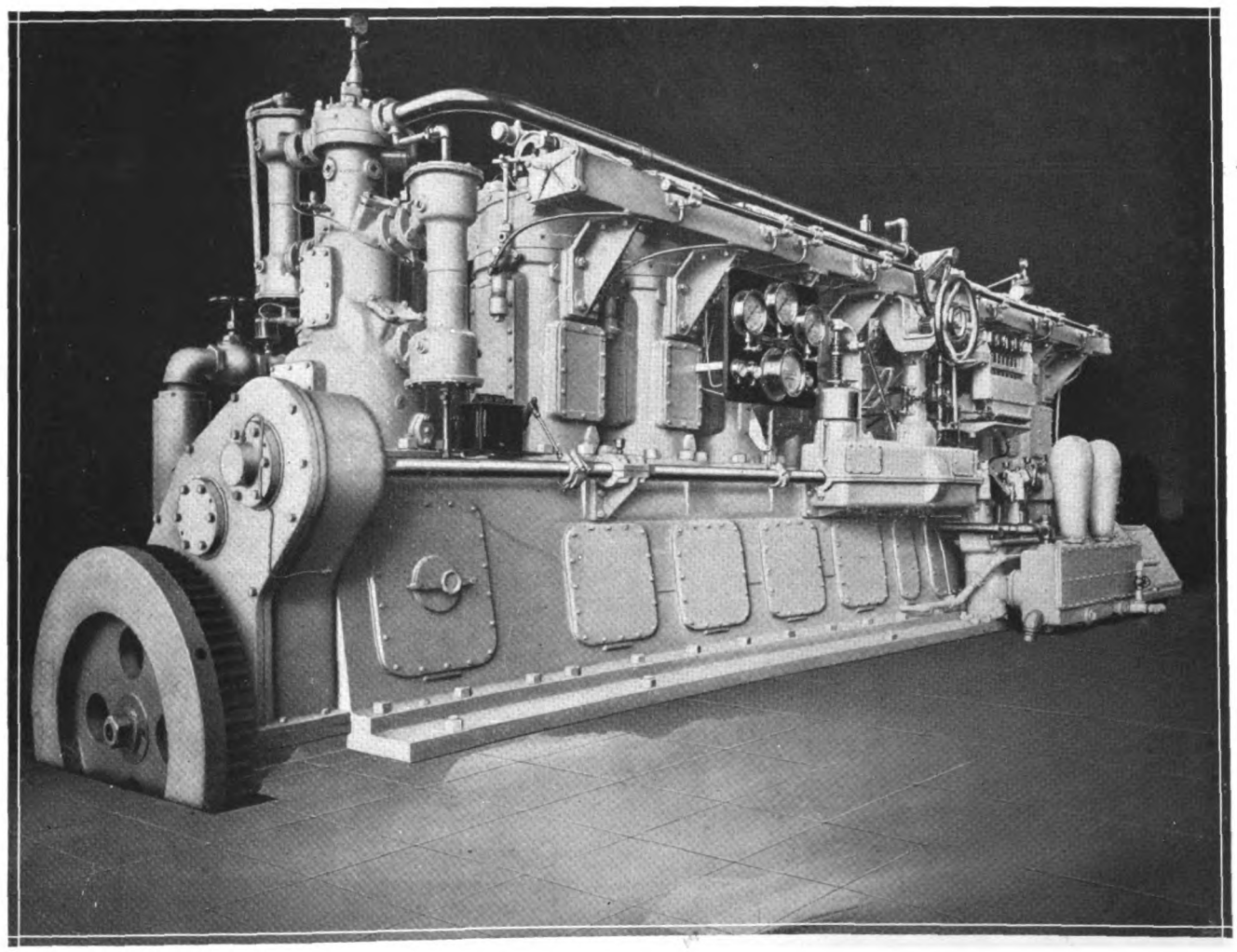
Winton

OIL DIESEL TYPE ENGINES

WINTON Oil Engines are built in four sizes and in power ranges from 125 to 450 H. P. Of the full Diesel type, these engines are distinctly and thoroughly American, substantial, highly developed, a finished product in every detail.

WINTON OIL ENGINES
are manufactured in the following sizes:

Model	Bore	Stroke	Power	No. Cylinders
54	7½"	11"	125 H. P.	Six
35	11"	14"	225 H. P.	Six
24	13"	18"	300 H. P.	Six
40	13"	18"	450 H. P.	Eight



CLEVELAND, OHIO, U. S. A.

San Francisco—F. G. Bryant, 593 Market St.
Jacksonville—D. J. Garrison & Co.

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FALK
HERRINGBONE GEARS

The Diesel-powered ship industry has long recognized the practical superiority of Falk Herringbone Reduction Gears.

This type of power transmission has proved particularly adaptable and highly efficient in Motorships because of its ability to deliver a smooth, continuous flow of power devoid of back-lash and minus the irregularities which mark the more common types of gears.

For rehabilitation work, as well as new installations, Falk Herringbone Gear Units are recommended by leading marine engineers.

Our engineering department will be glad to furnish you with such general or specific information as you may desire.

THE FALK CORPORATION

REPRESENTATIVES

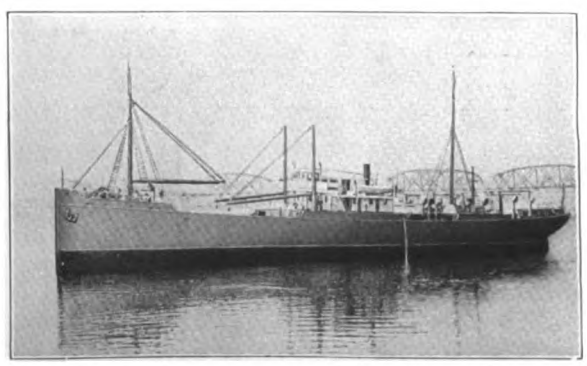
W. O. Beyer, 1007 Park Bldg., Pittsburgh, Pa.
M. P. Fillingham, 50 Church St., New York City.
F. W. Grimwood, Rialto Bldg., San Francisco, Cal.
Vulcan Iron Works, Wilkes-Barre, Pa.
Denver Engineering Works, Denver, Colo.

CANADIAN REPRESENTATIVE

Engineering Equipment Co., Ltd., 619-623 New Birks Bldg., Montreal, Quebec, Canada.

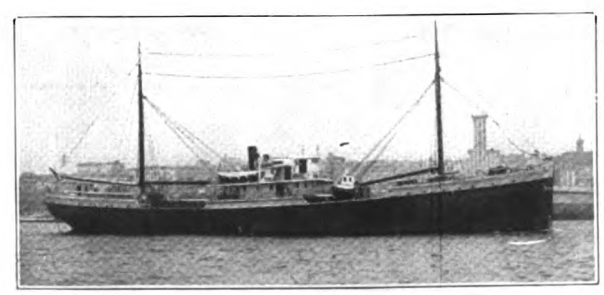
FOREIGN REPRESENTATIVE

Gustav Melms, 3 Rue Taitbout, Paris.



The "James Timson," another of the Diesel-driven freighters with Falk Herringbone Gears

FALK
HERRINGBONE
MARINE REDUCTION GEARS
ARE USED BY THE UNITED STATES NAVY FOR DEPENDABLE MECHANICAL EFFICIENCY



"Libby Maine," full powered twin-screw freighter equipped with Falk Reduction Gears. This ship is driven by twin-Dow Diesel Engines, 320 S.H.P. each at 420 R.P.M., propellers at 100 R.P.M. Made 63,185 nautical miles in 2½ years. Gears in perfect condition

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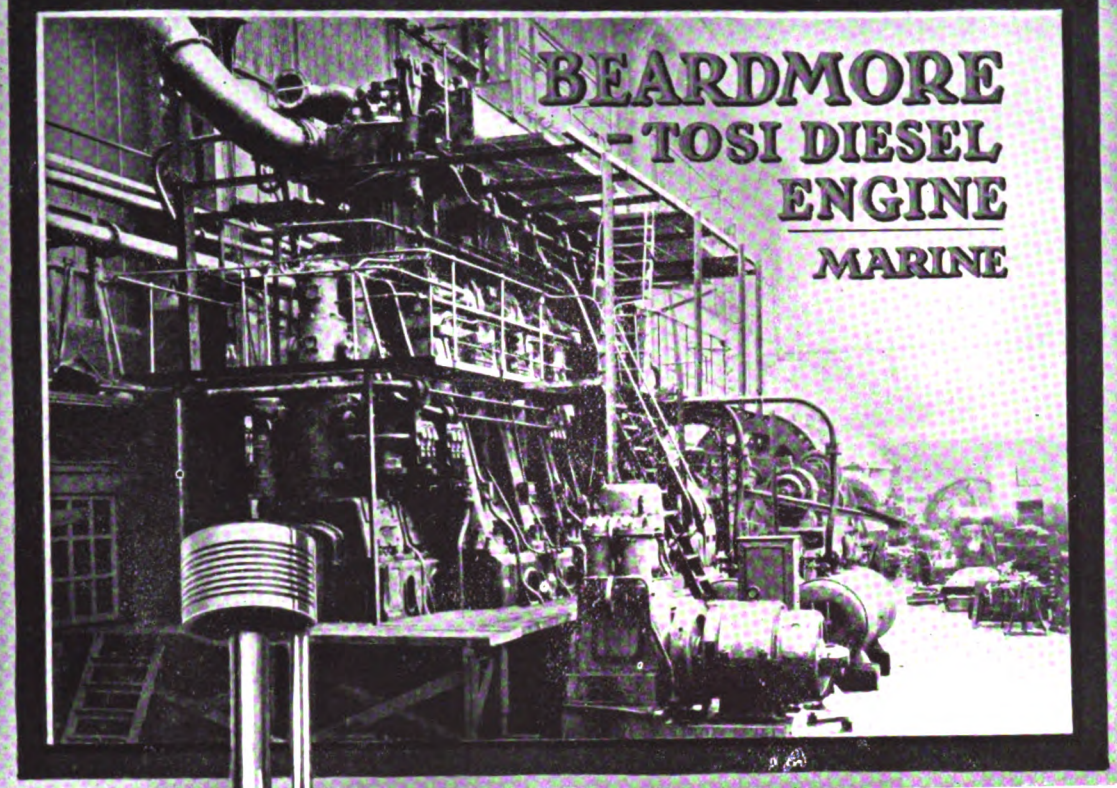
WILLIAM

BEARDMORE

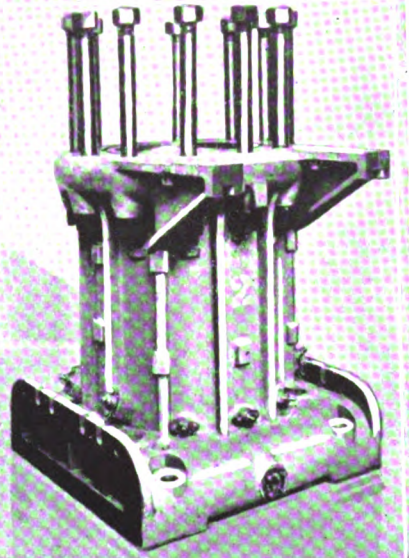
AND COMPANY LIMITED



PATENT VALVE GEAR

EXHAUST VALVE TROUBLES ELIMINATED

PATENT CYLINDER HEAD AND COOLING ARRANGEMENTS



Embodies the latest and most approved Diesel Engine practice

Extract from "The Engineer." November 11th, 1921.

"The Beardmore-Tosi Engine marks a distinct advance in four-cycle engine construction."

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

Results of 100 Hours' Trial

Average B. H. P.	1,276
Mechanical efficiency, per cent.	77
Average I. H. P.	1,646
Revolutions per minute	124
Mean pressure on B. H. P. basis, lb. per sq. inch	75.5
Fuel consumption, lb. per P. H. P. per hour	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. F.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average	125
Piston cooling water, outlet temperature deg. Fah., average	130
Blast air pressure, lb. per square inch.	1,000

NAVAL CONSTRUCTION WORKS

DALMUIR NEAR **GLASGOW**

Full Particulars, Catalogues ——— **on request**

Cable Address: "Beardmore, Glasgow." Codes: Liebers; Western Union, Bentley's: A1, A B C 5th Edition

LONDON, 36 VICTORIA ST., S. W. 2

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BOLINDERS

MARINE TRANSPORTATION CO.
HARBOR AND SOUND EXPRESS SERVICE
44 SOUTH STREET
NEW YORK

December 29, 1921.

Mr. Adolf Morner, President,
Bolinders Co., Inc.,
30 Church Street,
New York City.

Dear Sir:

As it is now eight months since we have had the 100 H. P. Bolinder Engine installed in our cargo boat "AURORA", we feel it our duty to let you know how well pleased we are with the performance of your engine.

Since its installation we have not expended a dollar for labor or replacement of parts. However, as much as we appreciate the very high quality of the material and the excellent workmanship of your motor, we feel that the outstanding feature is undoubtedly the low fuel consumption, the cost of which does not exceed thirty cents per hour at the present price of five cents per gallon for high grade oil.

Our boat is now engaged in freighting between New York and Nantucket, a run of 220 miles in the roughest kind of sea, which we accomplish in about twenty-five hours. This run we would not attempt in the winter season did we not have an engine on which we could absolutely depend, as our vessel is not equipped with any sails whatever.

In conclusion, permit us to express to you personally, and to your staff, our appreciation of your many courtesies, and the very valuable assistance rendered during the time our vessel was under construction.

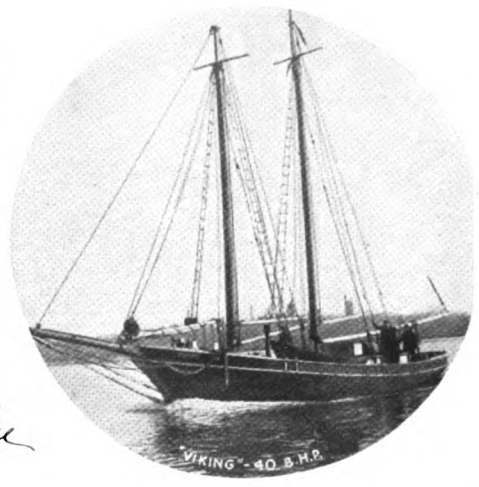
Very truly yours,

MARINE TRANSPORTATION COMPANY.

H. W. Nordell

Pres.

HWN:AAJ



The testimonial reproduced above is one among many on our files.
The vessels show a few of the latest BOLINDER installations.

WHERE SIMPLICITY, ECONOMY and RELIABILITY ARE REQUIRED BOLINDER ENGINES WILL DO THE WORK TO FULLEST SATISFACTION.

BOLINDERS COMPANY, Inc., 30 Church St., New York City

BOLINDERS COMPANY, 411 Exchange Building, 53 State Street, BOSTON, MASS.

BOLINDERS COMPANY
Compostela 47
HAVANA, CUBA

COMPAÑIA BOLINDER
Avenida de Mayo 560
BUENOS AIRES, ARGENTINA

CARIB TRADING CO.
CARTAGENA, COLOMBIA

BOLINDER'S COMPANY · J K G · TRADE MARK · NEW YORK U.S.A.

FIDANQUE BROS. & SONS
PANAMA, REP. OF PANAMA

HENRY LUND & CO.
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SWEDISH STEEL & IMPORTING CO., Ltd.
Shaughnessy Building
MONTREAL, CANADA

ALEXANDER McDOUGALL
ST. JOHN'S, NEWFOUNDLAND

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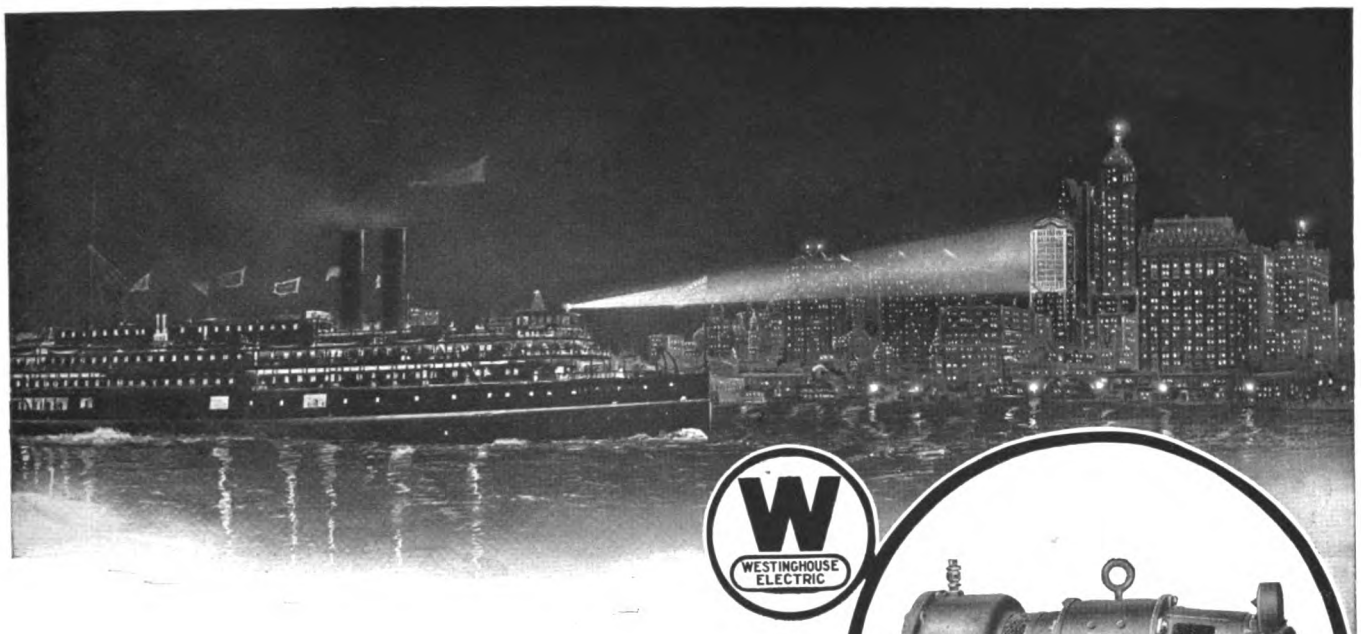

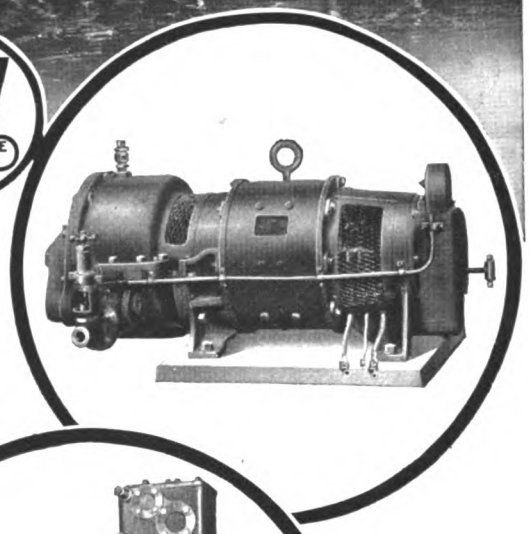

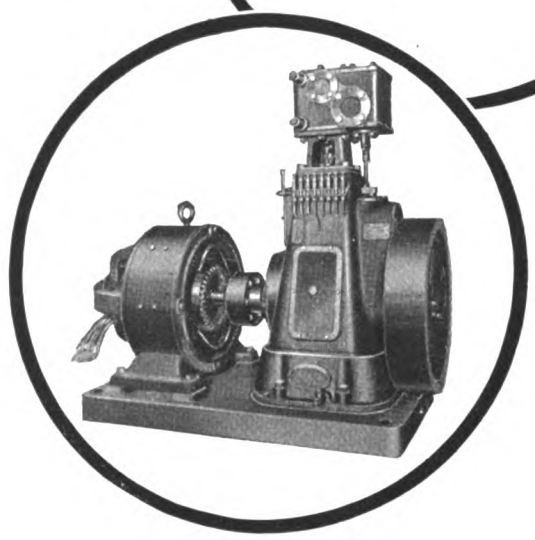

Marine Lighting

From the complete line of Westinghouse Turbine and Engine-Driven lighting sets, any requirement of passenger or cargo-carrier service can be satisfactorily met.

The chief characteristics of Westinghouse Lighting Equipment are, in the order of their importance—Reliability, Economy and Compactness.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Sales Offices in All Principal American Cities
Special Pacific Coast Representatives
Hunt, Mirk & Company
San Francisco

Westinghouse
MARINE AUXILIARIES

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BUNKER FUEL OIL

The vast organization and scope of the Standard Oil Company (New Jersey) make it possible to offer Shipping interests world-wide facilities for bunkering with "STANDARD" Fuel Oil. This service offers opportunities for effecting the decided economies resulting from the use of "STANDARD" Fuel Oil.

Ports at which deliveries can be made through arrangements with the Standard Oil Company (New Jersey), 26 Broadway, N. Y.

UNITED STATES

Atlantic and Gulf Ports

*New York
Boston
*Philadelphia
*Baltimore
*Norfolk
*Charleston
*New Orleans
*Baton Rouge

Pacific Coast Ports

*Seattle
Tacoma
Astoria
*Portland
*San Francisco
*Richmond
*Point Wells
*San Pedro
*San Diego
*Honolulu

CANADA

*Halifax
*Montreal
*Levis (Quebec)
*Vancouver
Prince Rupert

MEXICO

Tampico

PANAMA CANAL

Cristobal
*Balboa

WEST INDIES

Havana
Cienfuegos
Nuevitas
San Juan
Bermuda
Curacao
St. Thomas

SOUTH AMERICA

Rio de Janeiro
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*Buenos Aires
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AZORES

Ponta Delgada

*Diesel oil also available

UNITED KINGDOM

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Genoa

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CHINA

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JAPAN

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STANDARD OIL COMPANY (New Jersey)

26 Broadway, New York

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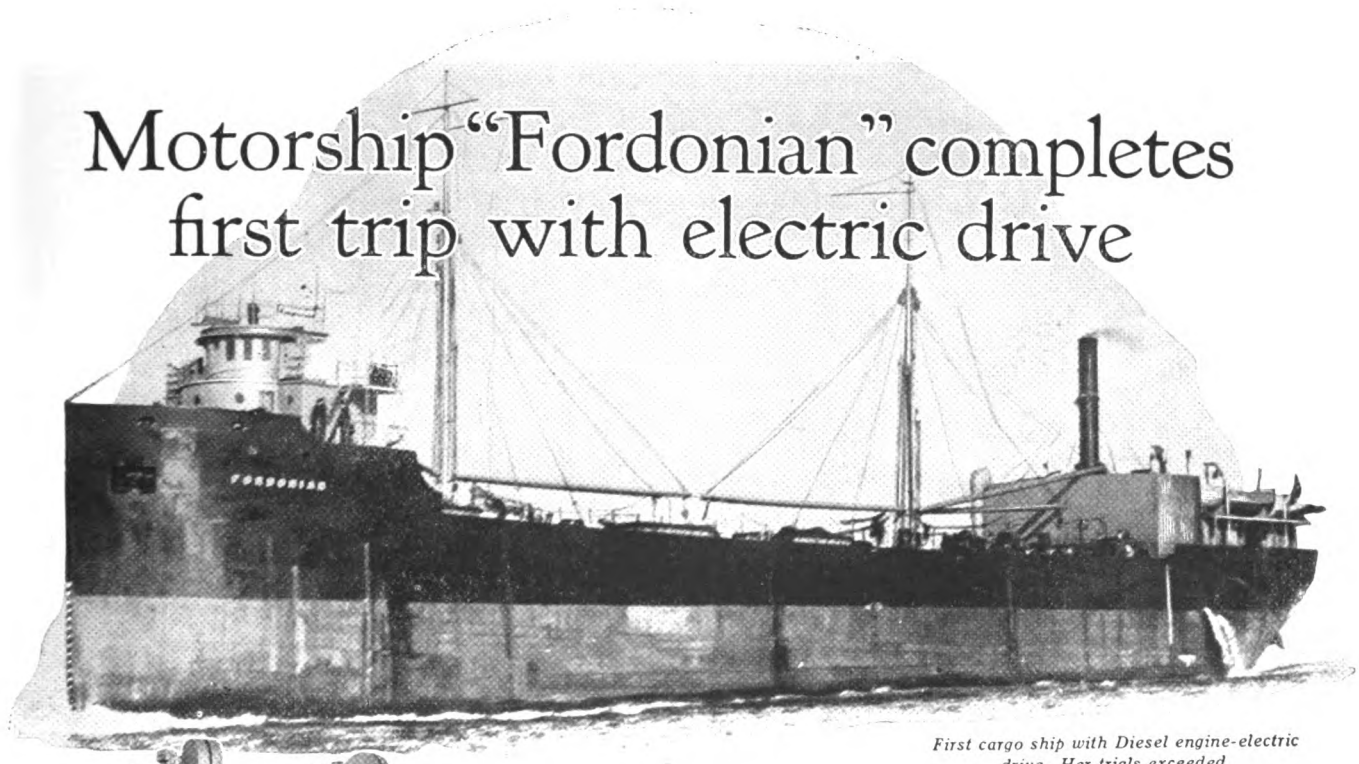
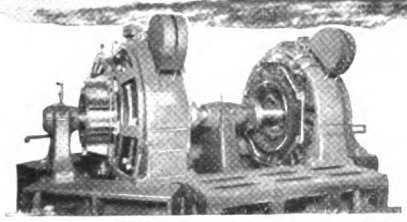
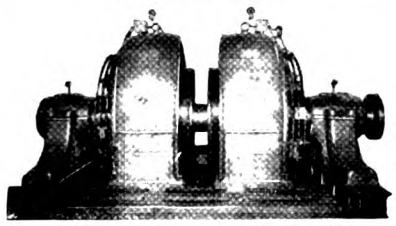
Motorship "Fordonian" completes first trip with electric drive



First cargo ship with Diesel engine-electric drive. Her trials exceeded expectations



The "Fordonian's" two generators coupled for test before shipment



Double-armature propulsion motor

View of control room on the "Fordonian"

THE successful operation of the "Fordonian's" new propulsion machinery on her trip to Cuba, makes Diesel engine-electric drive for cargo ships a fact.

Reliability—The "Fordonian" has two Diesel engine generators, either of which furnishes enough power to drive the ship at approximately 80% speed. Her double-armature motor is actually two motors on the one propeller shaft, either of which can take current from either generator.

Flexibility—Electrical control has given the "Fordonian" a flexibility for maneuvering which has exceeded anything possible with her former direct drive. Reversing and speed changes are accomplished by simply turning the handle of a controller in the engine room.

The performance of the "Fordonian" shows the way to more economical propulsion of motorships. For even larger tonnages G-E electric propulsion machinery is available, as well as auxiliary electric power plant equipment and motors and control, all specially built for sea service.

G-E MARINE EQUIPMENT
TO MEET ALL YOUR REQUIREMENTS
Electric Drive for Motorships
Turbine-Electric Drive
Marine Geared Turbines
Electric Drive for Auxiliaries

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

26-38

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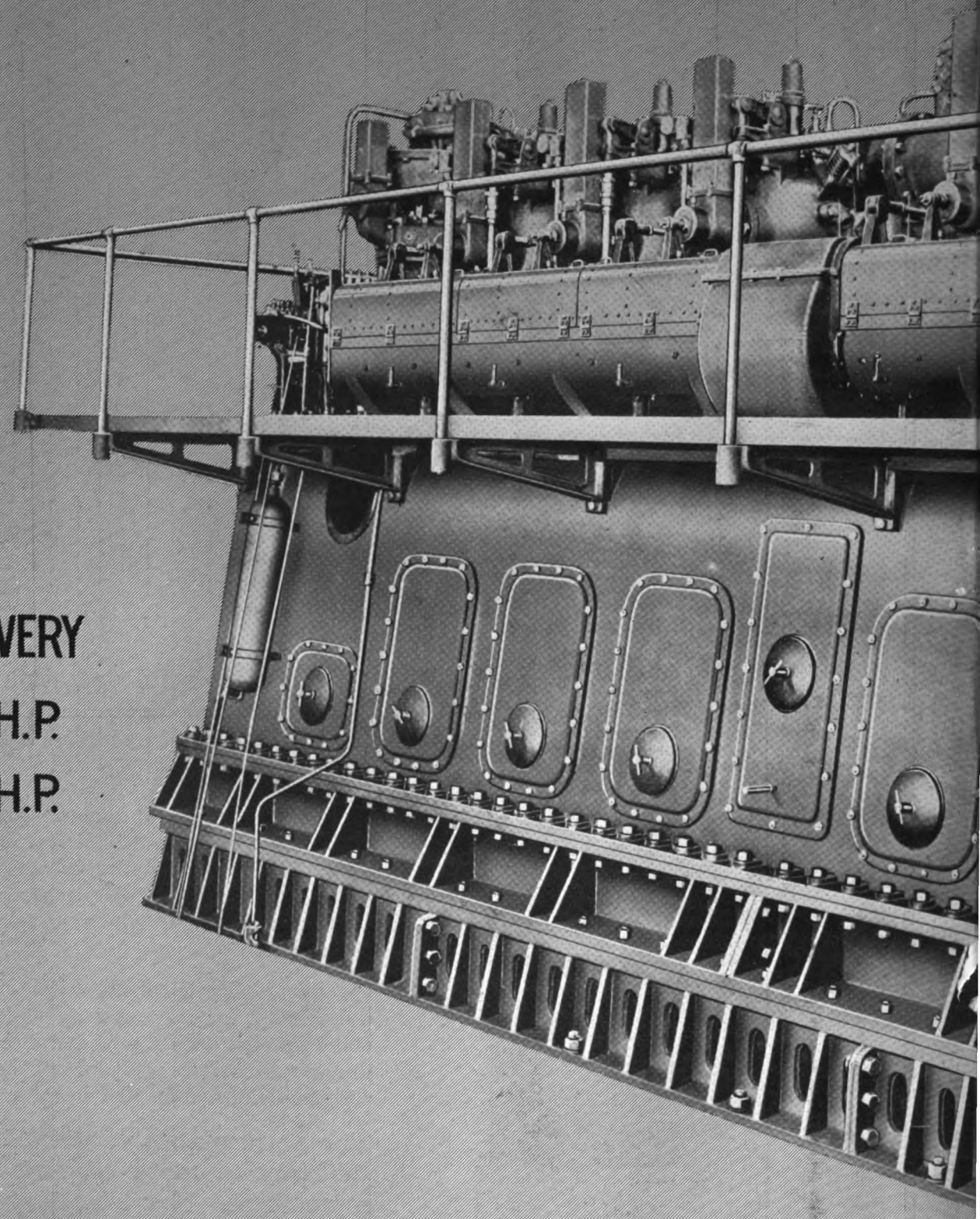
NELSECO DIESEL ENGIN



SIZES
FOR EARLY DELIVERY
120 H.P., 180 H.P.
240 H.P., 360 H.P.
480 H.P.

600-750 B.H.P., 225 R.P.M., 4 cycle, 6 cylinders

HEAVY-DUTY MARINE OR STATIONARY DIESEL ENGINE

NELSECO

New London Ship
Groton

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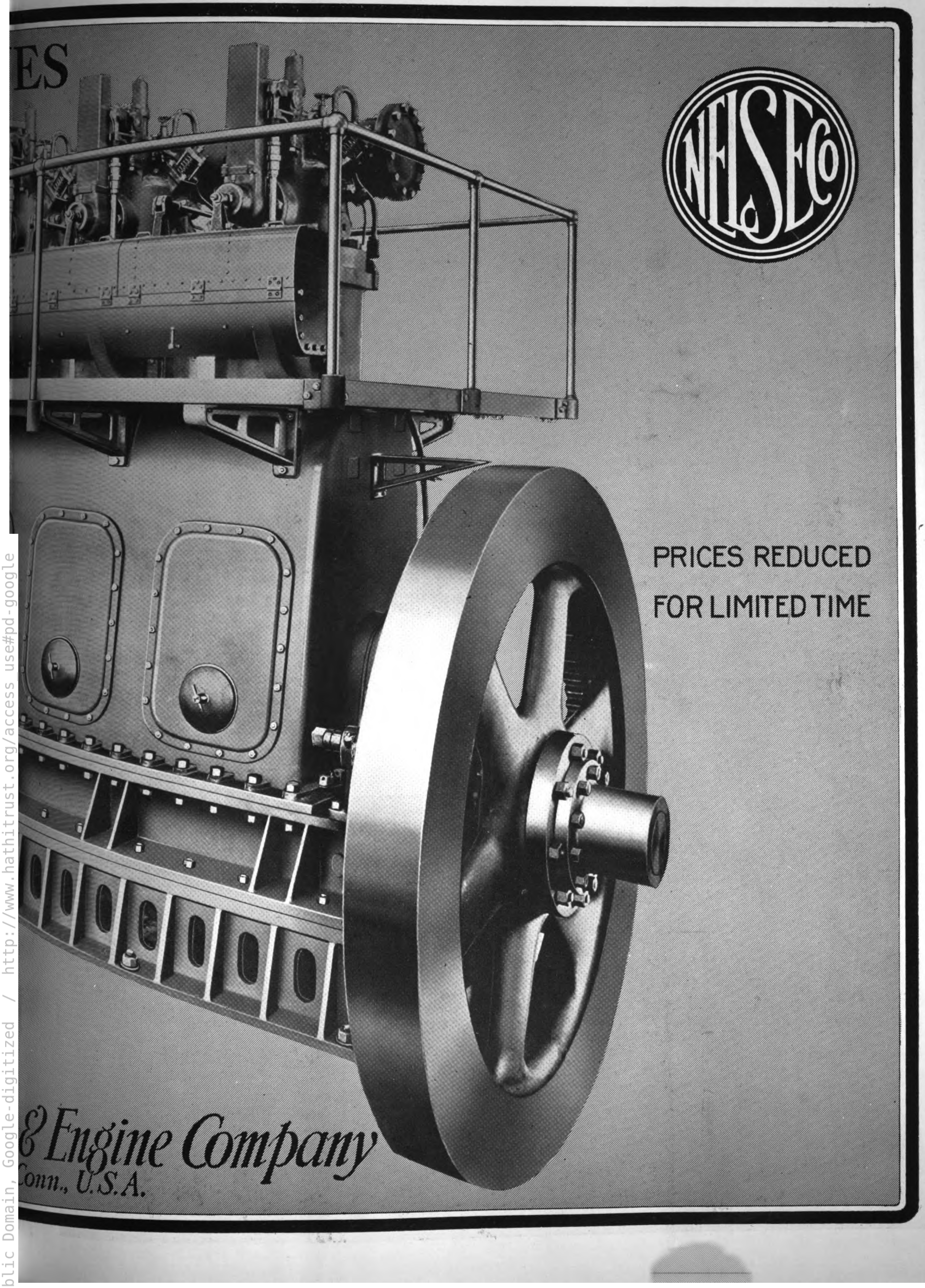

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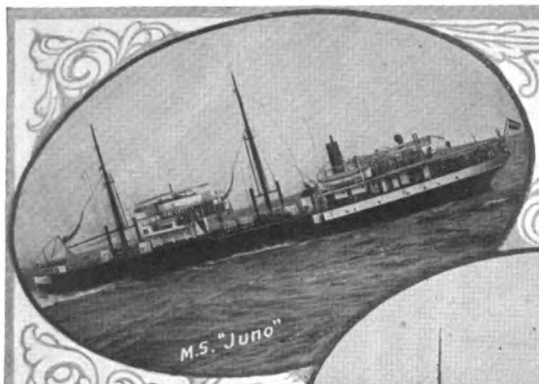
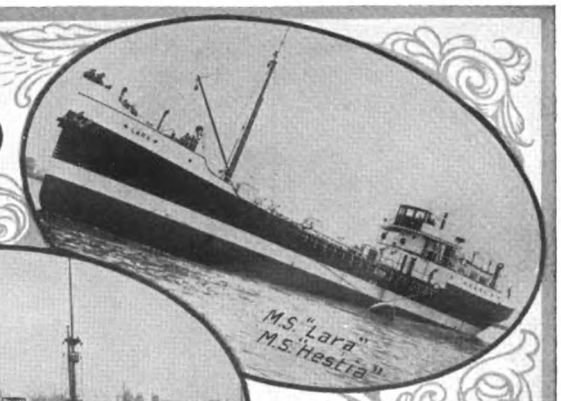
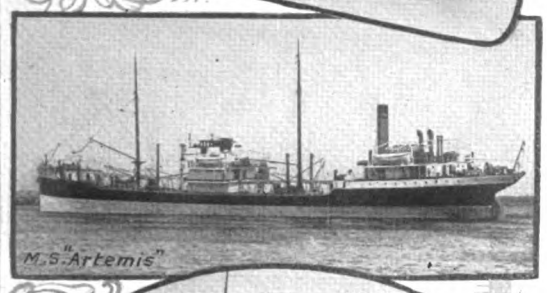
Some WERKSPOOR ENGINED MOTORSHIPS

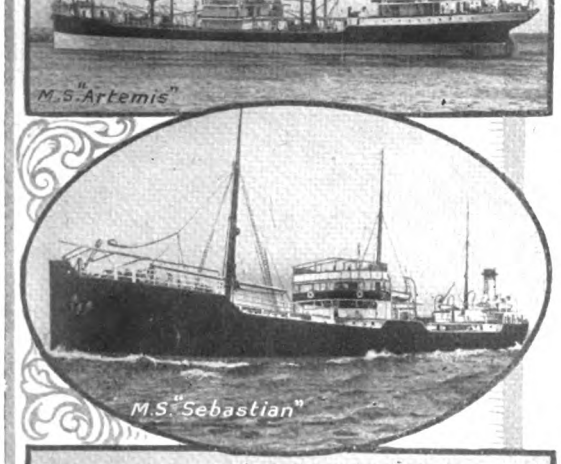


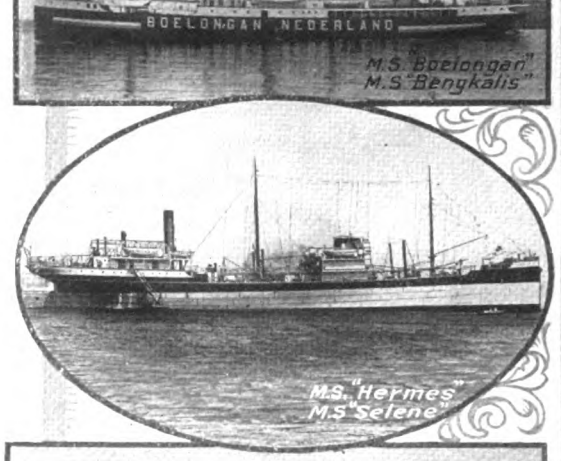




1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800



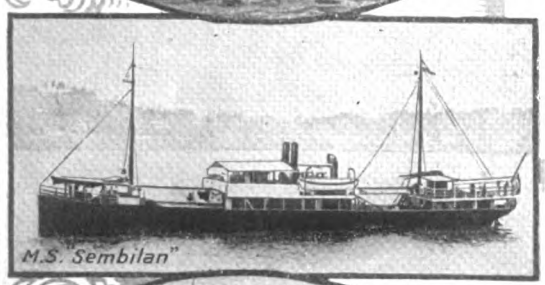


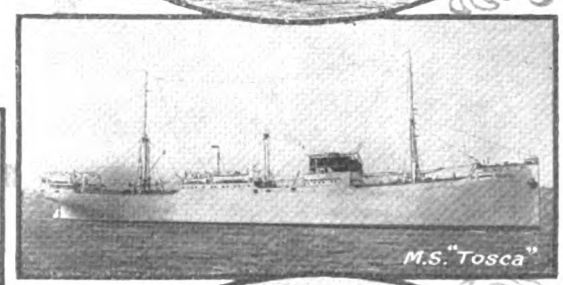
FOUR-CYCLE DIESEL ENGINES

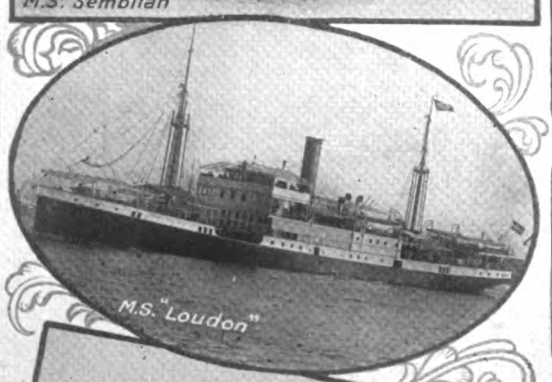
WERKSPOOR

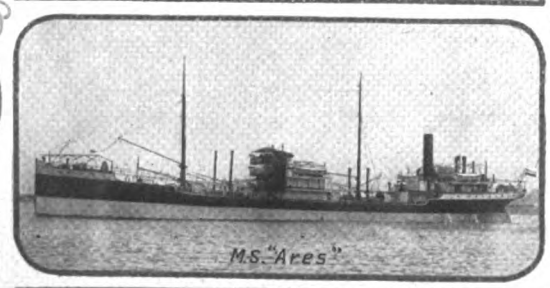
AMSTERDAM - - HOLLAND

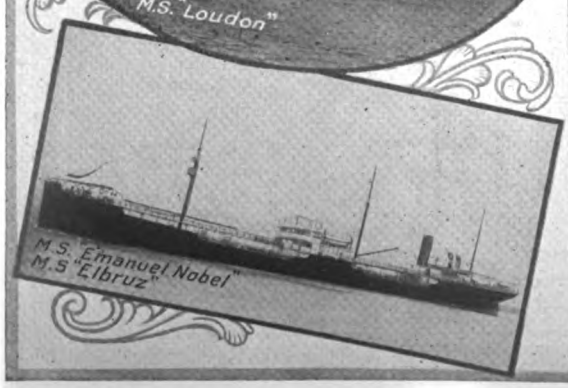
U. S. Representative:
WM. BRAAT
730 Tribune Bldg., N. Y. City

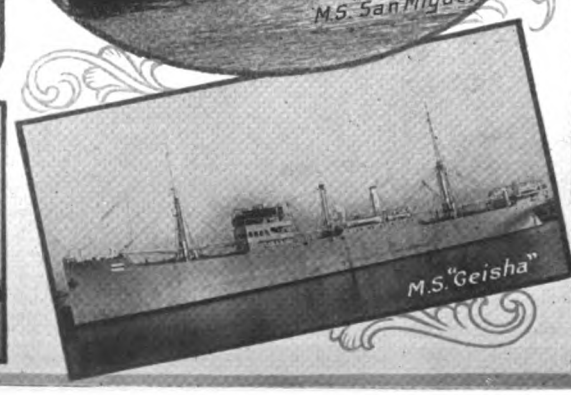












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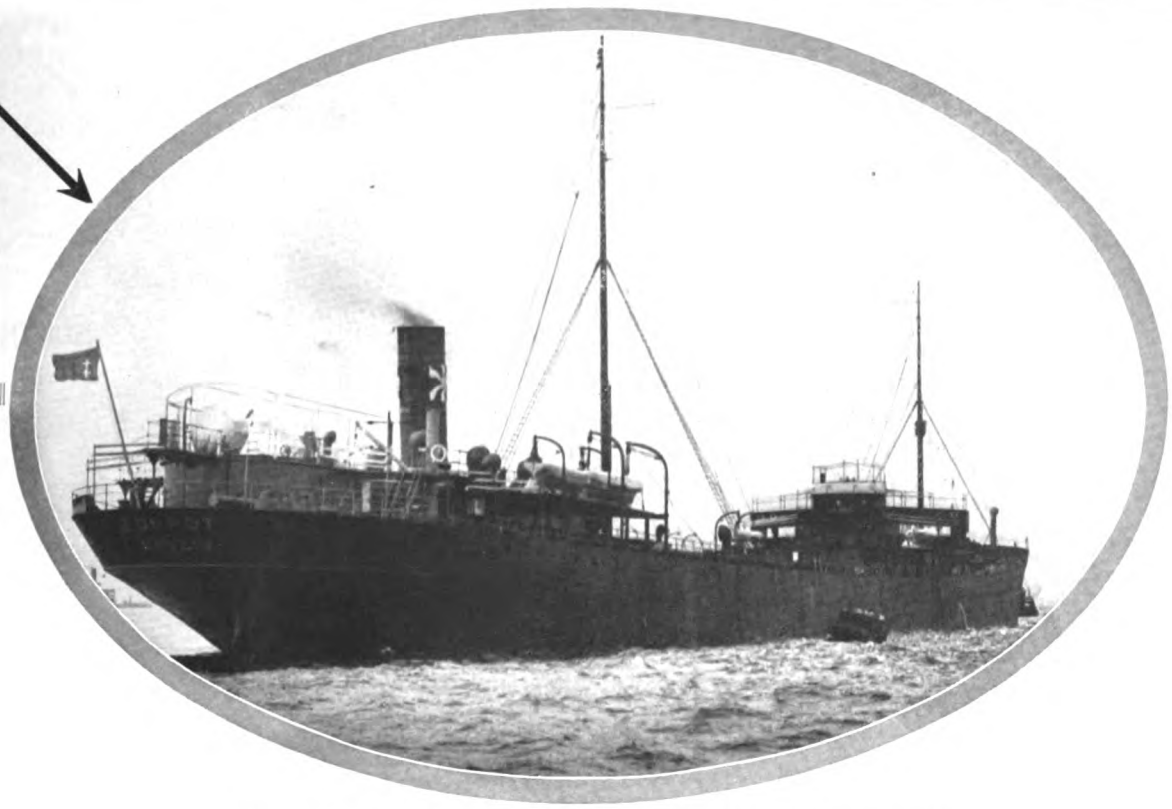
KRUPP DIESEL ENGINES

THE SHIP



The Krupp Diesel-Engined Tanker "Zoppot"

AVERAGE SEA SPEED - 11.14 KNOTS
DAILY FUEL-CONSUMPTION - 14 TONS

Loaded Displacement	22,000 Tons (about)
Capacity	119,700 Bbls. Oil
Mean Light Speed	11.64 Knots
Mean Loaded Speed	10.64 Knots
Performance to-date	80,000 Nautical Miles
Power	3,400 Shaft Horse Power

ALL TYPES OF DIESEL ENGINES

DIRECT-DRIVE —— ELECTRIC-DRIVE

FOUR-CYCLE, TWO-CYCLE, MARINE & STATIONARY TYPES

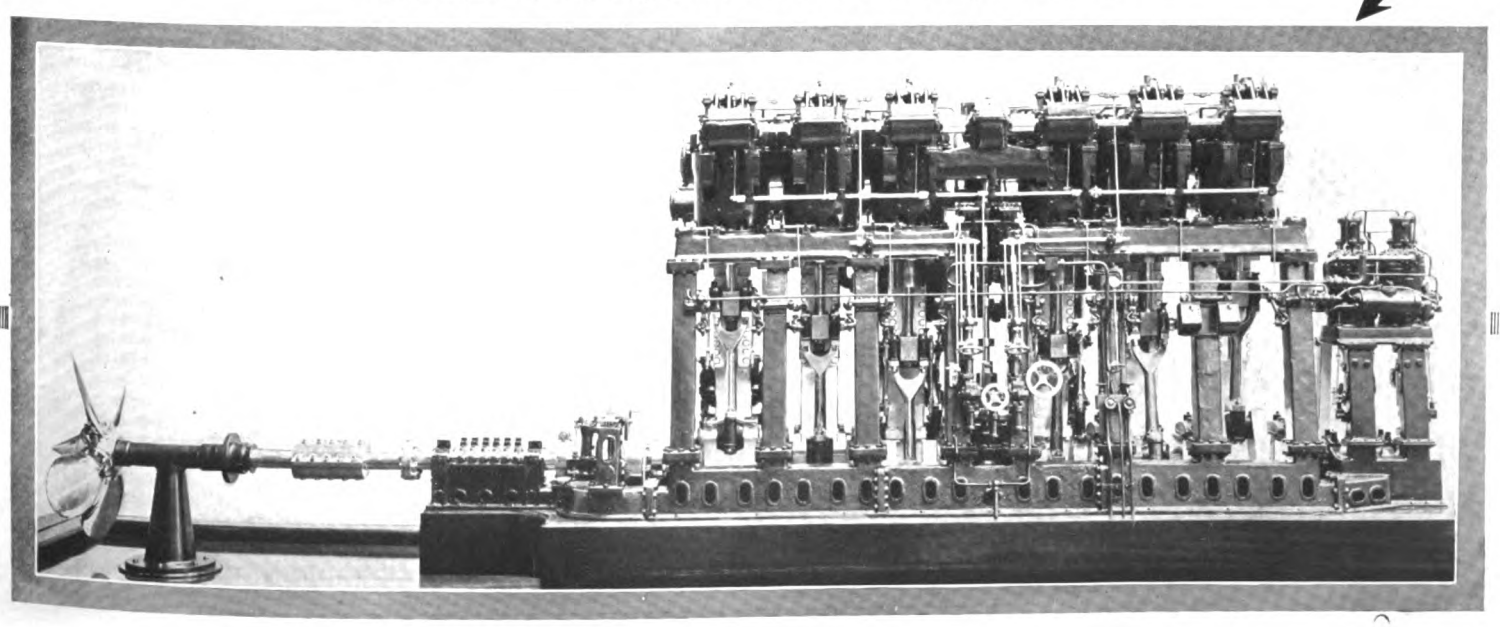
45 to 10,000 Shaft Horse-Power Actually Constructed in Single Units

High-Speed, Low-Speed, Light-Weight, and Heavy-Weight Models

AMERICAN KRUPP-SYSTEM DIESEL ENGINE COMPANY

165 BROADWAY, NEW YORK CITY, U. S. A.

THE ENGINE



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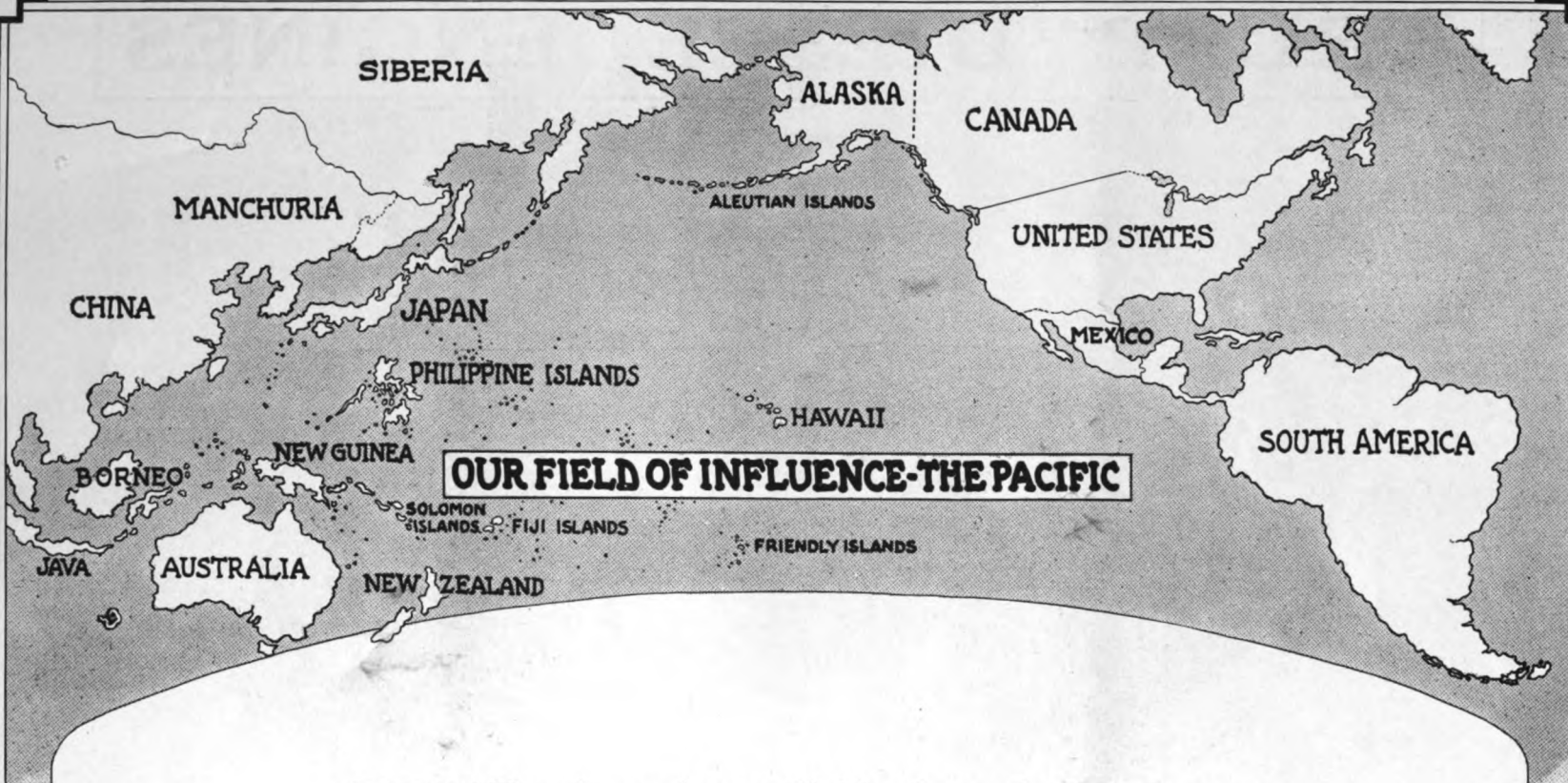

THE marine market provided by the people of the western coast of the Americas and the insular countries of the Pacific is one of the greatest in the world. It is a market made possible by geographical barriers and expansive coastal territory, where inter-communication, trade relations and the transaction of the ordinary every day affairs depend upon the motor boat. Trans-Pacific and ocean trade naturally falls to the great steamships and motorships engaged in this service, but the harvest of natural resources, fishing, towing, passenger service, lightering and neighborly exchange depend almost absolutely upon the motorboat.

There are literally thousands upon thousands of motor boats plying the coast sections of this vast territory, operating upon the rivers, in the bays and inlets—100,000 on the Pacific Coast of North America alone.

For 15 years Pacific Motor Boat has served this field—cultivating and broadening trade relations, encouraging the adoption and use of modern equipment, promoting the use of the motor boat for commercial purposes and encouraging yachting for pleasure. The strength and influence of this magazine is a result of strict adherence to its original policy to serve this section and confine its activities to this particular territory.

Many manufacturers have established their trade connections, not only on the Pacific Coast of the United States, but in Pacific and Asiatic territory through their advertising in Pacific Motor Boat, a sample copy of which we will gladly mail upon request.

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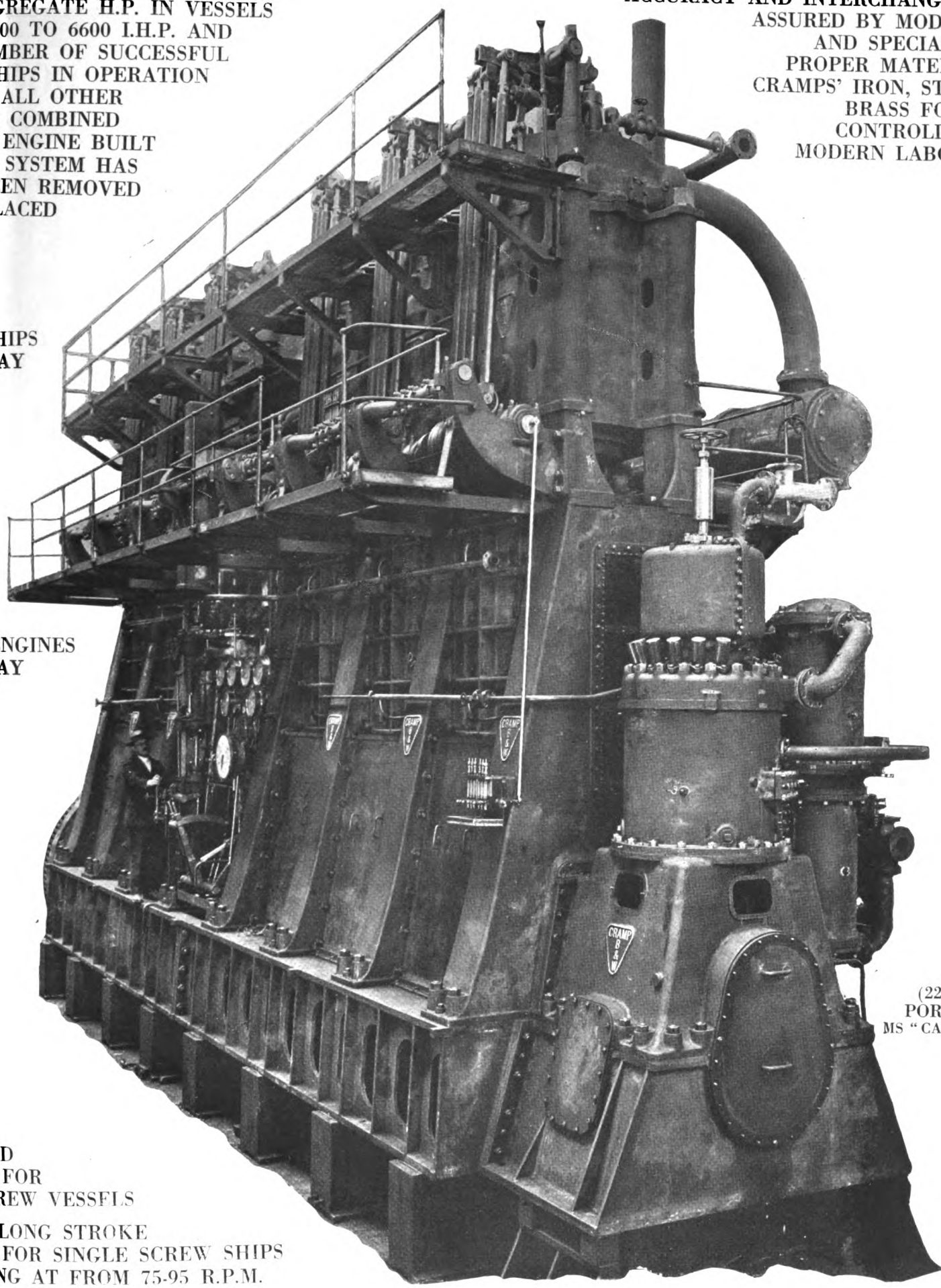
UNDER THE B. & W. SYSTEM
THE AGGREGATE H.P. IN VESSELS
FROM 1500 TO 6600 I.H.P. AND
THE NUMBER OF SUCCESSFUL
MOTORSHIPS IN OPERATION
EXCEED ALL OTHER
SYSTEMS COMBINED
AND NO ENGINE BUILT
TO THIS SYSTEM HAS
EVER BEEN REMOVED
OR REPLACED

ACCURACY AND INTERCHANGEABILITY
ASSURED BY MODERN JIGS
AND SPECIAL TOOLS;
PROPER MATERIALS BY
CRAMPS' IRON, STEEL AND
BRASS FOUNDRIES
CONTROLLED BY A
MODERN LABORATORY

MOTORSHIPS
THAT STAY
ON THE
SEAS

DIESEL ENGINES
THAT STAY
IN THE
SHIPS



(2250 I.H.P.)
PORT ENGINE
MS "CALIFORNIAN"

STANDARD
ENGINES FOR
TWIN SCREW VESSELS

SPECIAL LONG STROKE
ENGINES FOR SINGLE SCREW SHIPS
OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE

(Burmeister & Wain System)

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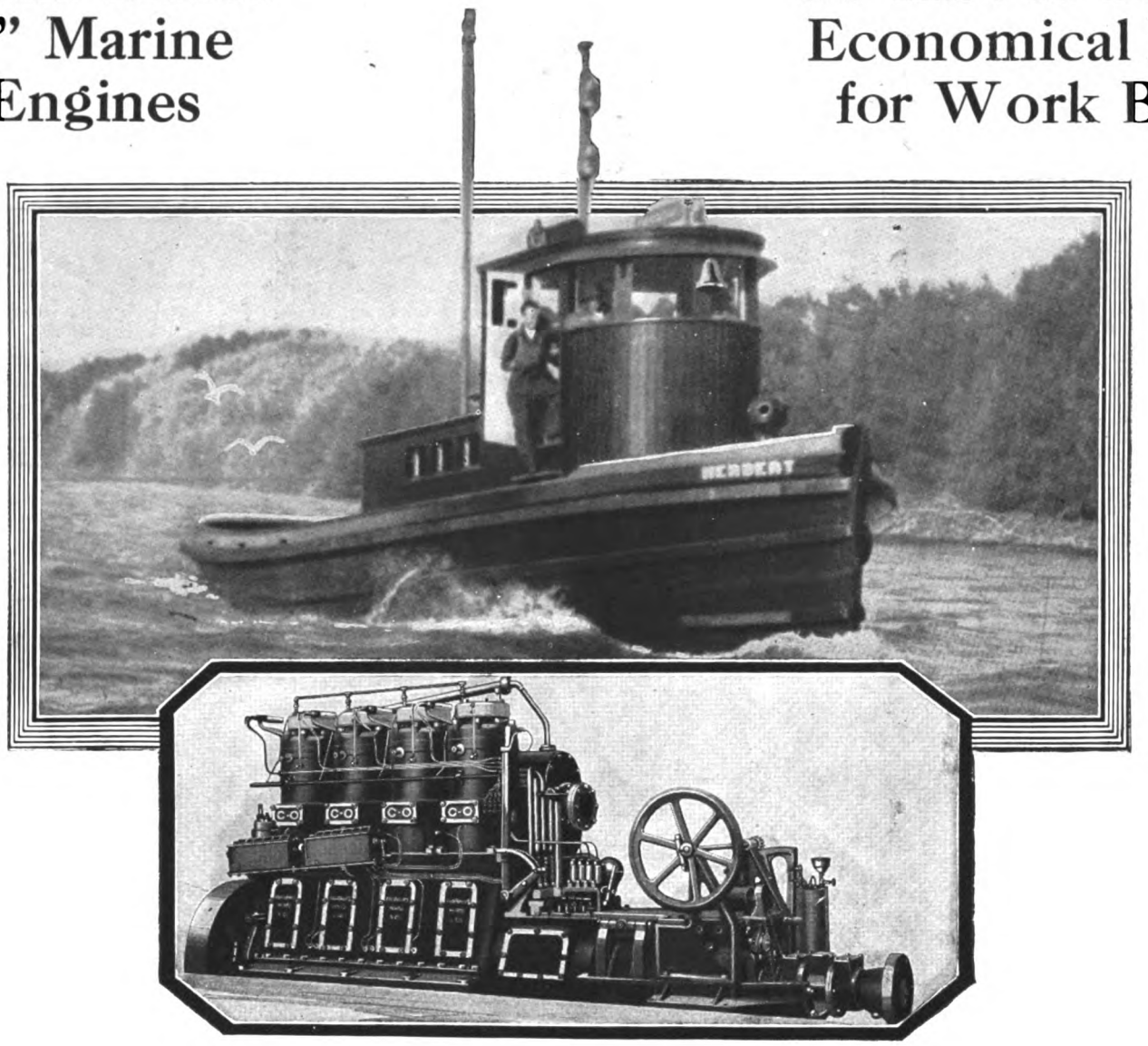
Fairbanks-Morse "C-O" Marine Oil Engines

30 H.P. to 300 H.P. Economical Power for Work Boats



Power from Low Cost Fuel Oils

The "Herbert" has a mighty desirable reputation as a money-maker due in large measure to the excellent operation of her "C-O" engine on low grade fuel oils.

"C-O" marine oil engines have been building up records of economy and dependability year after year. They use the low grade fuel oils most easily obtained—run steadily with perfect regulation in choppy seas—remain cool under the gruelling service of long hauls at low speed under heavy load. They are simple—require little attention. From every angle the "C-O" engine is the profit producing power for workboats.

Fairbanks, Morse & Co.

MANUFACTURERS CHICAGO

The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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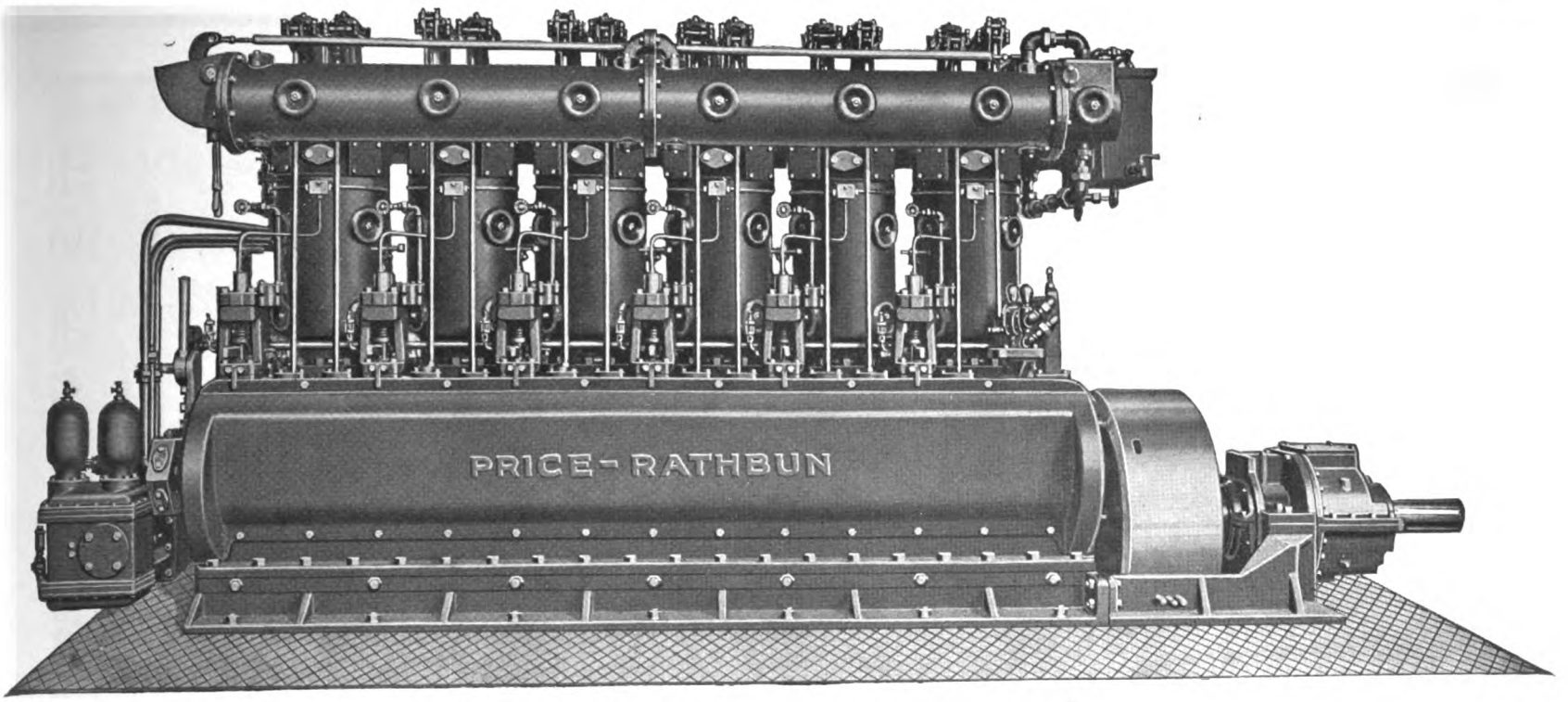

The Test of Comparison

In most cases any oil engine must compete with steam engine or turbine drive and stand the test of engineering comparison.

Compare the Price Oil Engine with other types of drive from the following three angles:

Cost of prime mover and necessary auxiliaries.
Consumption and cost of fuel and lubrication.
Cost of attendance and upkeep.

Price Oil Engines have direct-injection of fuel without the use of compressed air. The elimination of the high-pressure injection air compressor increases the engine's mechanical efficiency and materially reduces the possibility of breakdown.

Ignition is by heat of compression only—there are no hot bulbs, plates or liners.

The guaranteed fuel oil consumption of Price Engines is 0.45 pounds per brake horse power hour. The guaranteed lubricating oil consumption is one gallon per 4000 brake horse power hours.

The selection of materials and the conservative design and rating of Price Engines insure long life and freedom from breakdown.

PRICE OIL ENGINES

Bulletin 10102 tells the complete story. Send for your copy and subject Price Engines to the test of comparison.

Ingersoll-Rand

11 BROADWAY NEW YORK CITY

OFFICES IN ALL PRINCIPAL CITIES

Butte	El Paso	Knoxville	Cleveland	Philadelphia
Birmingham	Seattle	Scranton	Pittsburgh	San Francisco
Duluth	St. Louis	London	Los Angeles	Salt Lake City
Denver	Chicago	Paris	Detroit	Joplin
Boston	New York	Houghton	New Orleans	Dallas

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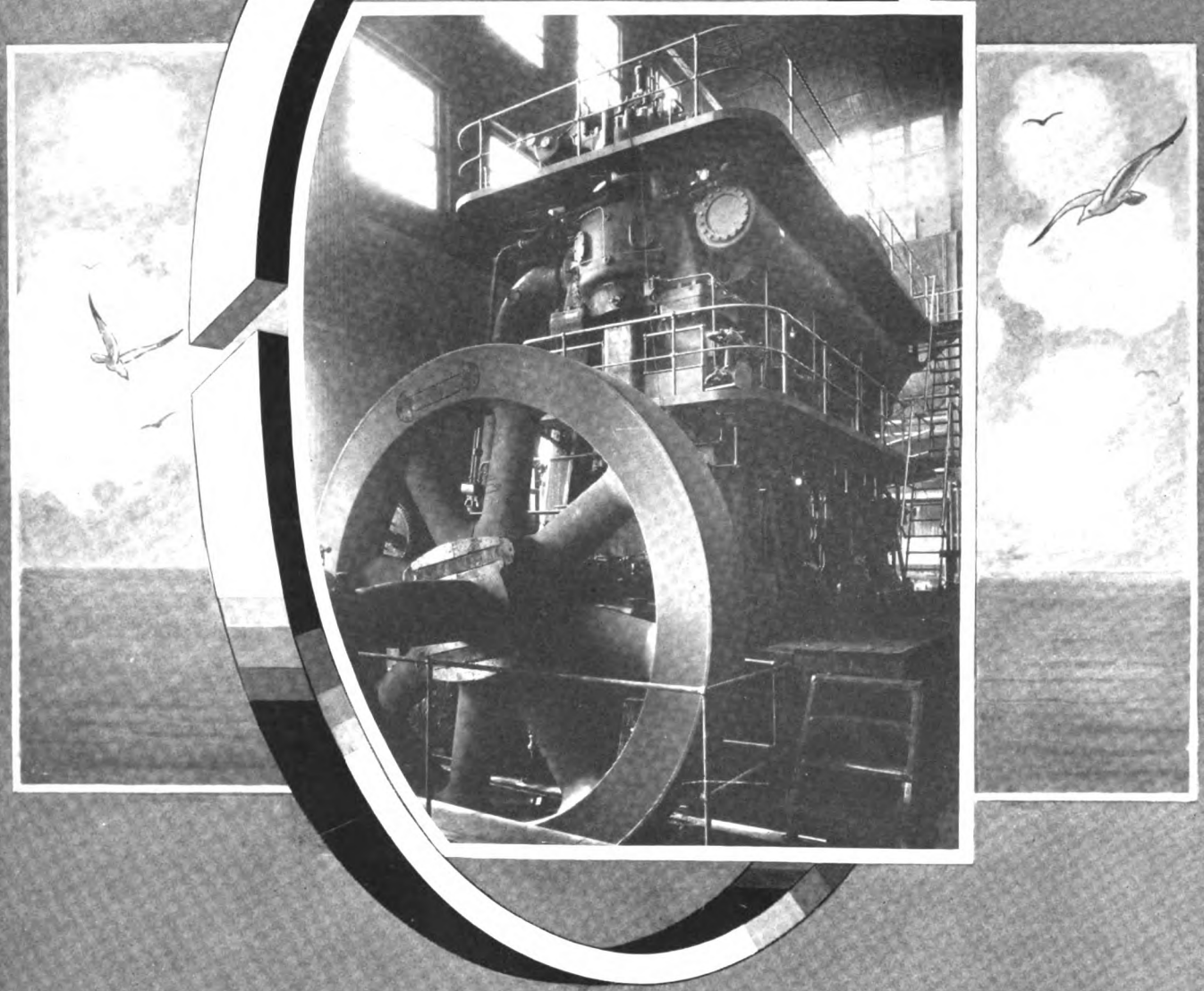
QUALITY SNAP RINGS

Showing Nordberg Diesel Engine equipped with Quality Snap Rings.

"More Than a Million a Month"



THE Piston RING COMPANY

MUSKEGON, MICH.

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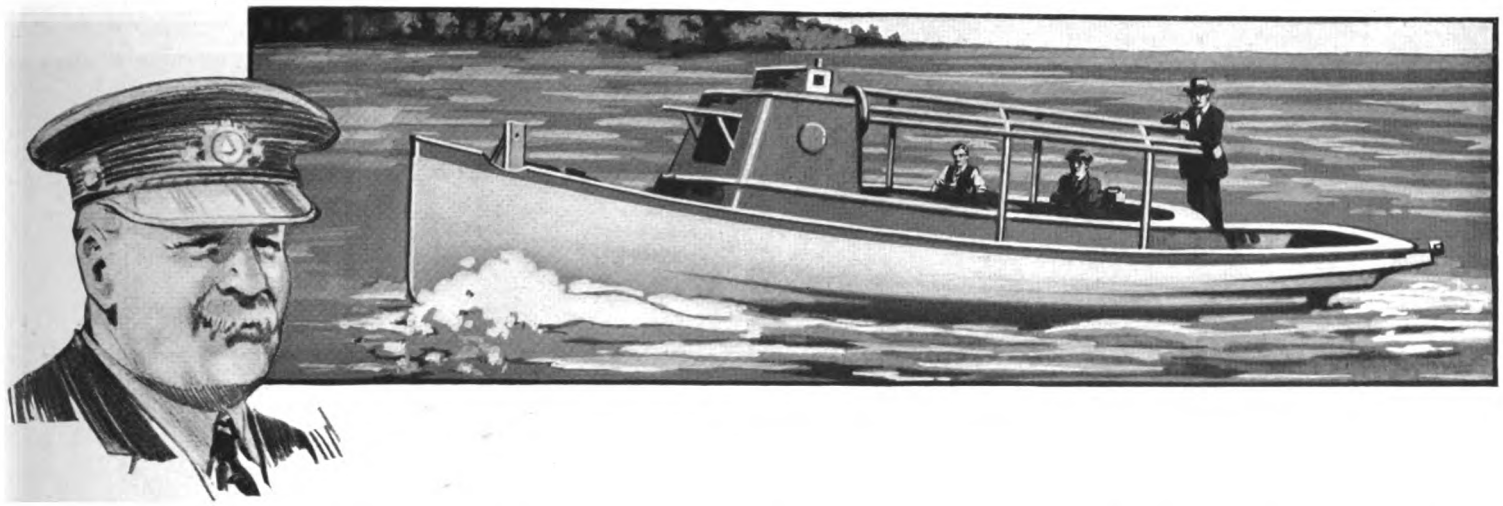


Cap'n Allswell on "African Surf Fighters"

At most African ports the water's about on a level with your cigar case, when it's quiet, which ain't often.

Ships have to lay out where it's deep. Natives lighter the cargo. Some of it reaches dock the same day. Some you dredge for.

To beat this, the U. S. Shipping Board put a fine gas tug on each of six African steamers, and it's working out great!

Of course, as each tug tows half a dozen heavy-loaded boats, all a bumpin' and poundin' one another, it offers a problem. You've got to have a quick, powerful pull back of you, always ready, or you'll bring your string of lighters in keel up!

To make sure of results, the Shipping Board engineers built the hulls extra heavy, and put in a mighty fine engine. Then they topped it all off with a Style H 34 inch Columbian Bronze Propeller of 26 inch pitch and a slip of only 16.3%!

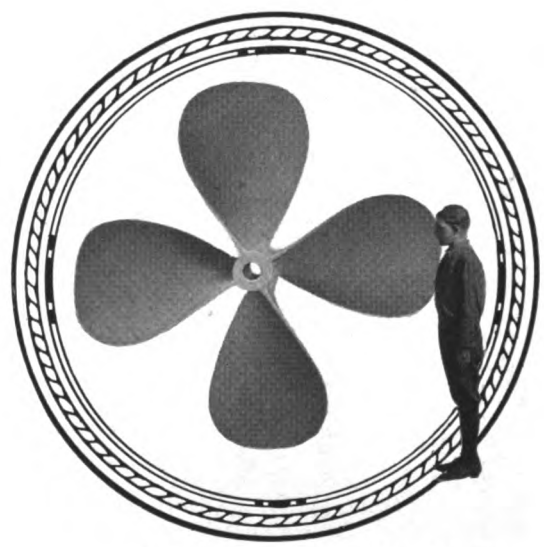
All of which explains the recent report that these surf fighters have proved a whale of a success.

Send for Columbian Bulletin No. 12

THE COLUMBIAN BRONZE CORPORATION

522 Fifth Avenue, New York City

For New York Sales Only: 44 Third Avenue



Block "L" Main Floor, New York Motor Boat Show

COLUMBIAN *Bronze* PROPELLERS

for every craft afloat

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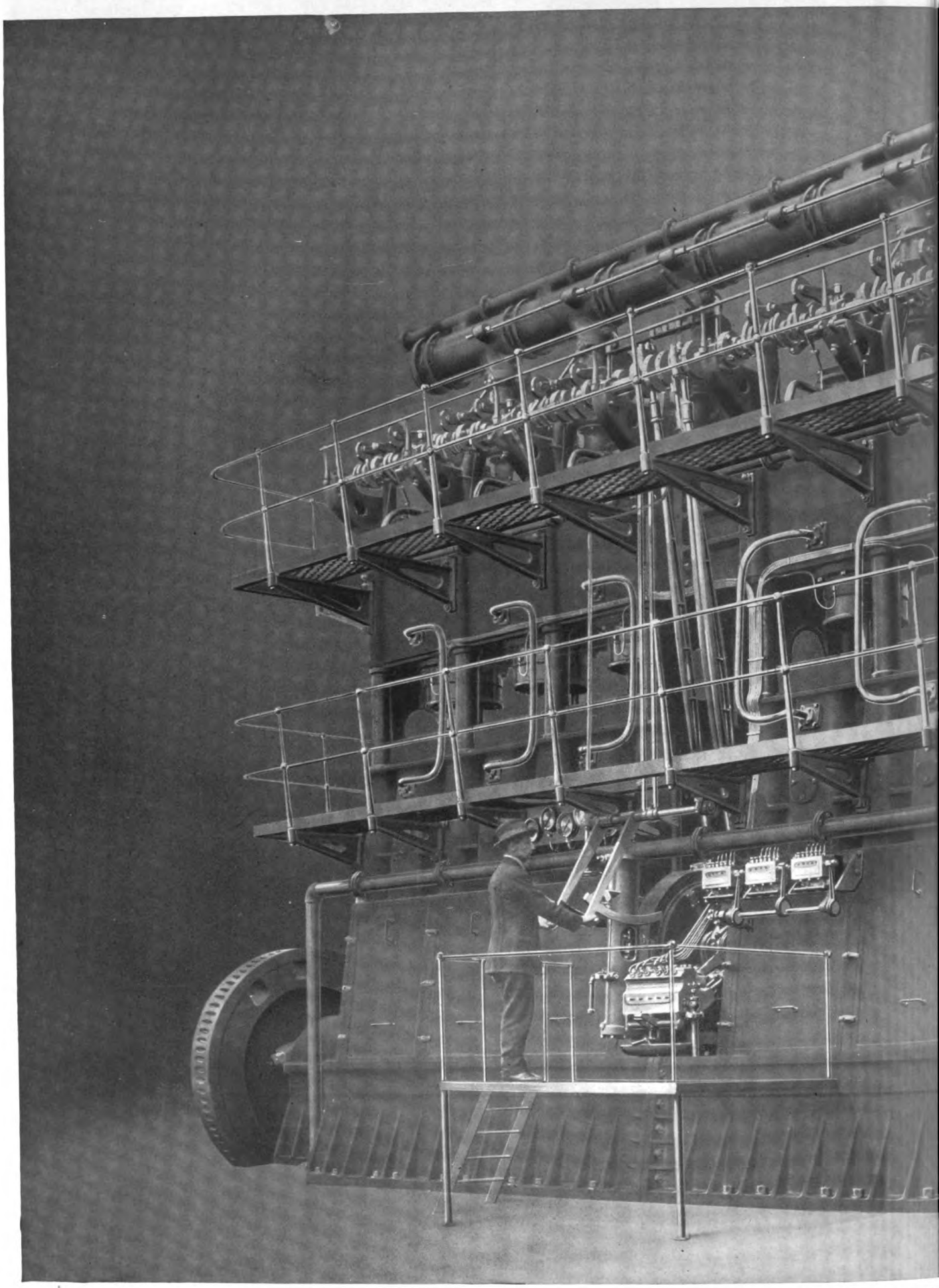
WERKSPOOR D



ECONO

MY

ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INST

PACIFIC DIESEL

OAKLAND,

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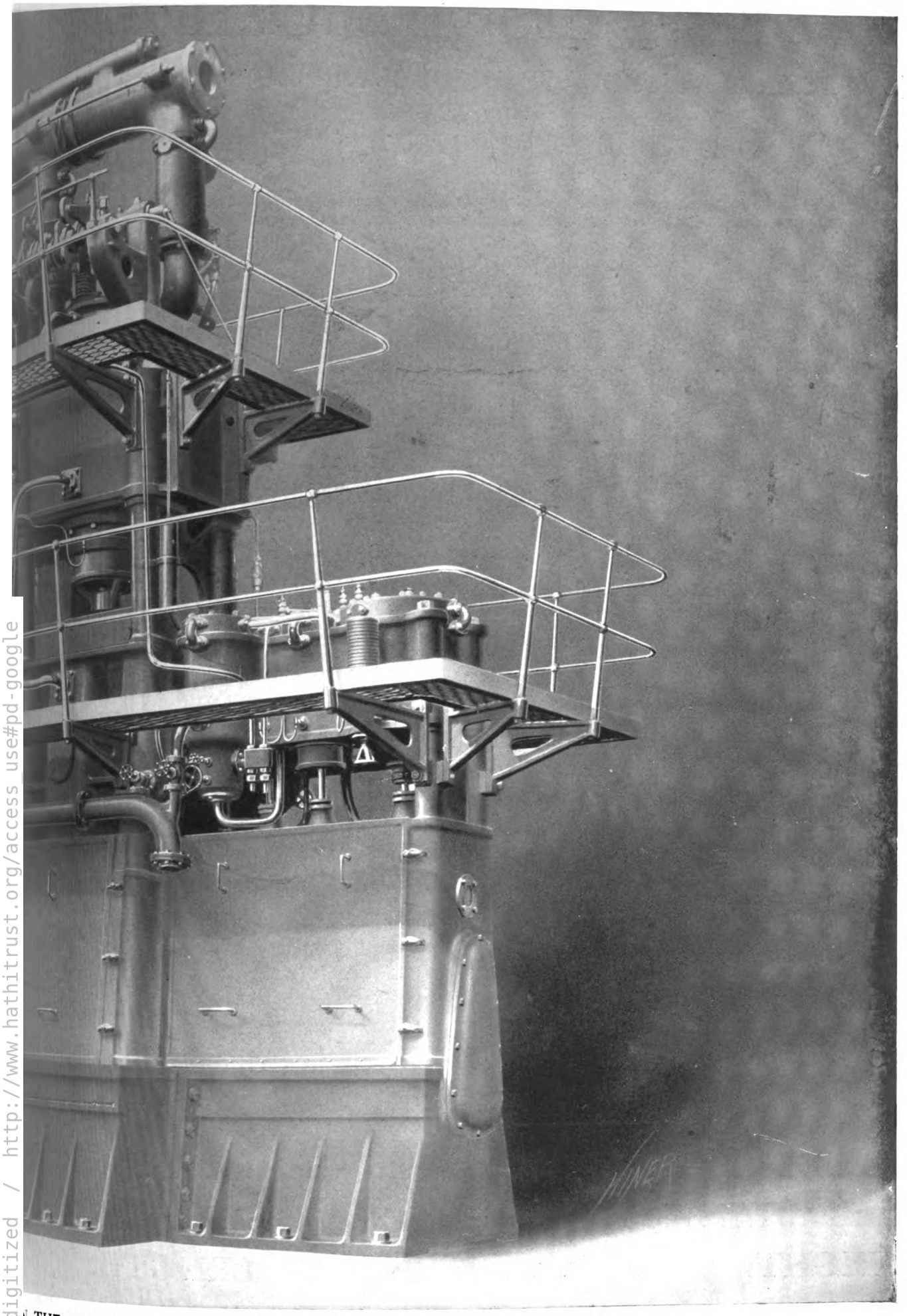
ESEL ENGINES



THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

NGINE COMPANY

LIFORNIA

RELIABILITY

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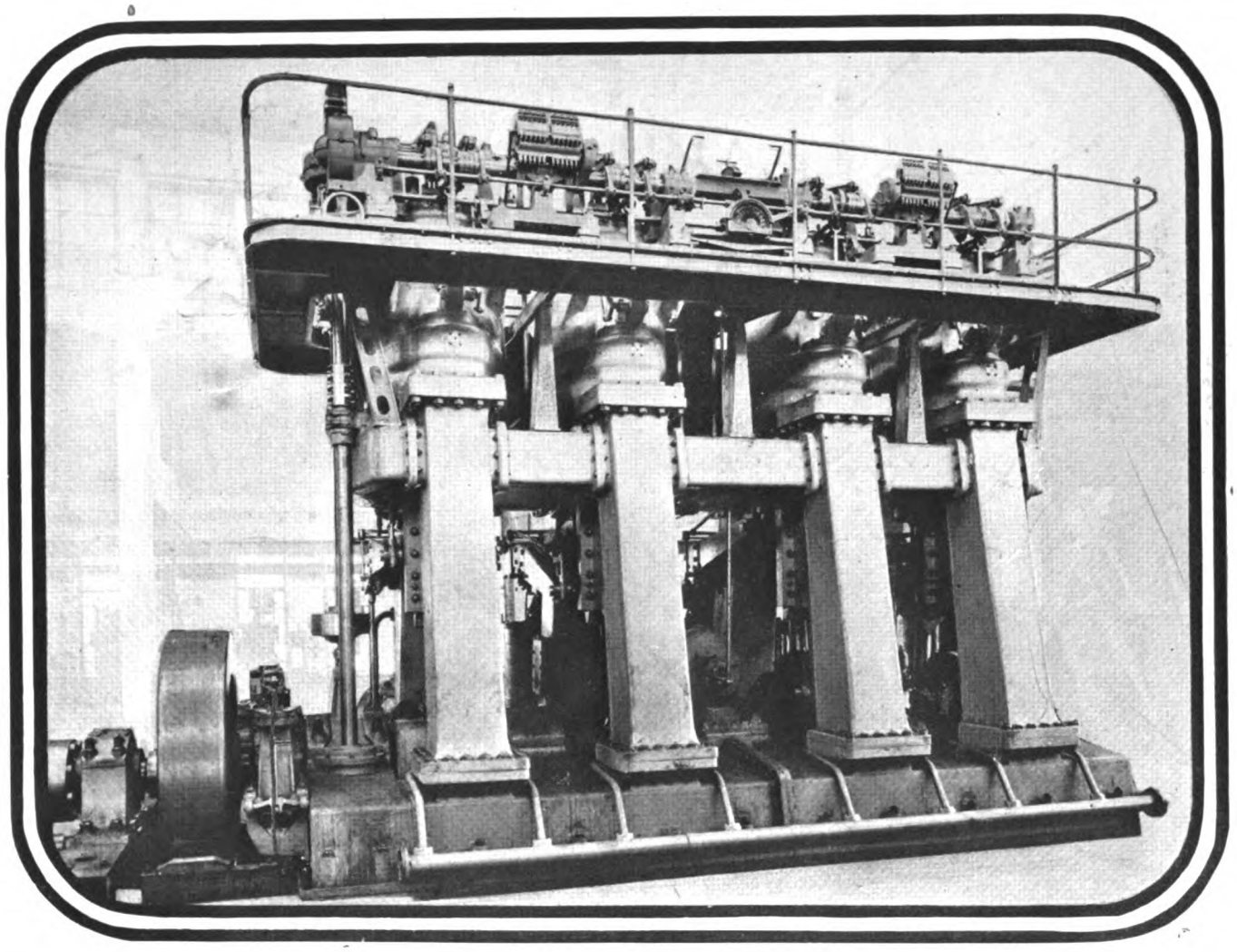
THE NOBEL-DIESEL CO., LTD.

(SVENSKA AKTIEBOLAGET NOBEL-DIESEL)

LETTERS: NYNÄSHAMN

NYNÄSHAMN, SWEDEN

TELEGRAMS: NOBELDIES STOCKHOLM



TWO-CYCLE DIESEL-ENGINES

FOR ALL PURPOSES UP TO 6000 I. H. P.

IN SIZES 3-, 4-, AND 6-CYL. UNITS

HIGHEST FUEL ECONOMY: 0.4 lb. per S. H. P.-HOUR GUARANTEED.

HIGHEST MECHANICAL EFFICIENCY: 80 per cent.

LIGHT WEIGHT: 220 lbs. per S. H. P. **MINIMUM LENGTH.**

SIMPLICITY and ACCESSIBILITY UNSURPASSED

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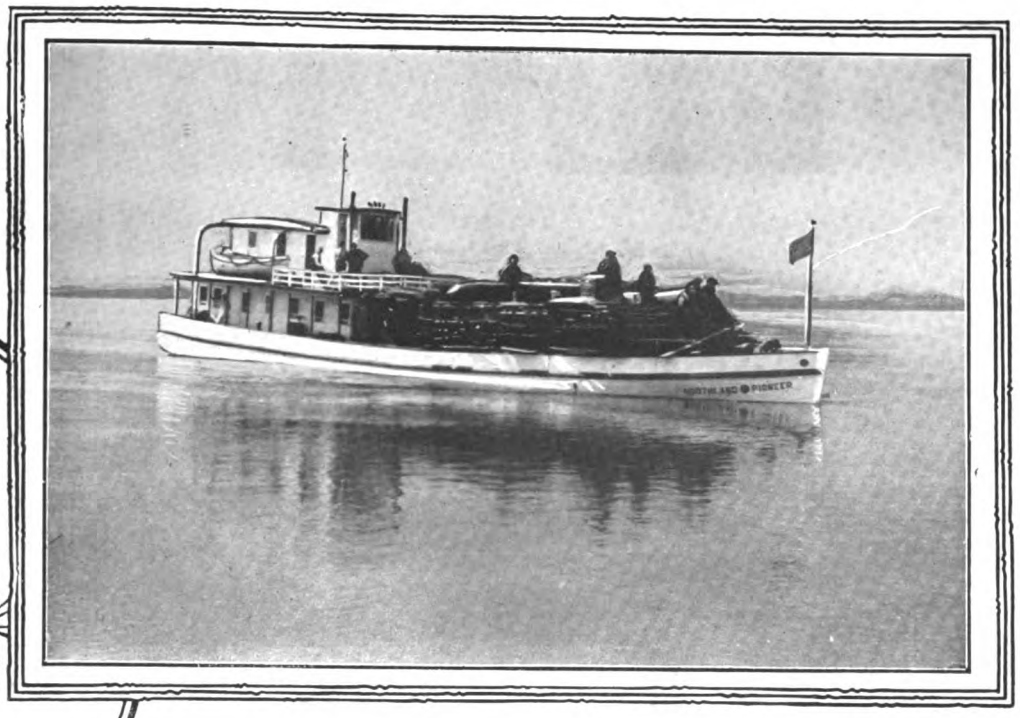
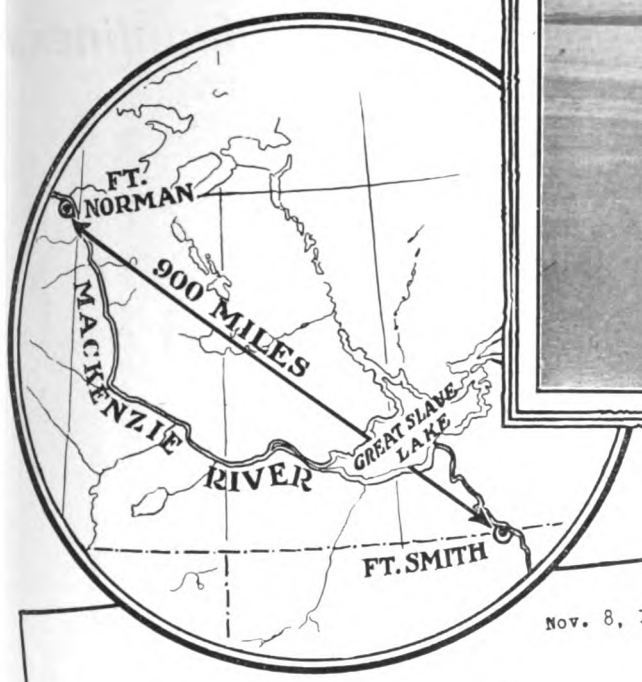
The "Northland Pioneer"
Length 100 ft.
Beam 20 ft.
Draft 4 ft. 8 in.
2-75 H.P. Dodge Heavy Oil Engines





Nov. 8, 1921.

Empire Engineering & Supply Co. Ltd.,
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Gentlemen:-

In reference to your request for information regarding the operation of the twin 75 H.P. Dodge Heavy Oil Engines, with which our new boat the Northland Pioneer was equipped at Fort Smith this Spring, we may say that these engines proved in service all you claimed for them.

On the voyage down from Fort Smith to the oil well near Fort Norman, we used kerosene, but as we did not wish to operate the engines at full speed immediately, no records of fuel consumption were kept.

At Fort Norman we took on crude oil from the Fort Norman Well, and while this oil was extremely dirty, the engines operated quite satisfactorily. Records kept on the return trip from Fort Norman showed a fuel consumption of .43 lbs. of fuel per B. H.P. Hour, which is less than the guarantee, and remarkable when compared with the fuel consumption of gasoline engines of a similar size on our other boats.

We can strongly recommend Dodge Engines for work in the north where conditions as you know require a simple, hardy, and economical engine. As a matter of fact, even if crude oil were not available in the north, and it was necessary to bring in kerosene or fuel oil for these engines, the fuel economy is such that the saving would pay for the engines in a short time.

Yours sincerely,

NORTHERN TRADING COMPANY,

Per. Roy Myers
Mgr.

RN/HM

1800 miles without trouble: fine record made by first oil powered vessel to make trip to Ft. Norman Oil Fields.

Loaded to the water line with casings, derrick timbers and machinery, through severe storms and difficult channels—1800 miles in all is the record of the successful trip from Ft. Smith to Ft. Norman, Canadian oil fields made by the "Northland Pioneer."

Read the engineer's story carefully. Note the fact that the two 75 H. P. engines operated successfully on the return trip using crude oil direct from the wells.

There was no time lost in taking on fuel wood—no valuable cargo space used for storage.

The record of the "Northland Pioneer" is not an unusual one for boats equipped with Dodge Heavy Oil Engines. Their sturdy simplicity—absence of trouble giving parts such as carburetors, switches, igniters, etc., fuel economy—ease of operation and low attendance costs adapts them to every class of work craft within range of sizes.

Prompt response will be made to inquiries from responsible dealers.

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12½ H. P. TO 75 H. P.

DODGE SALES AND ENGINEERING COMPANY
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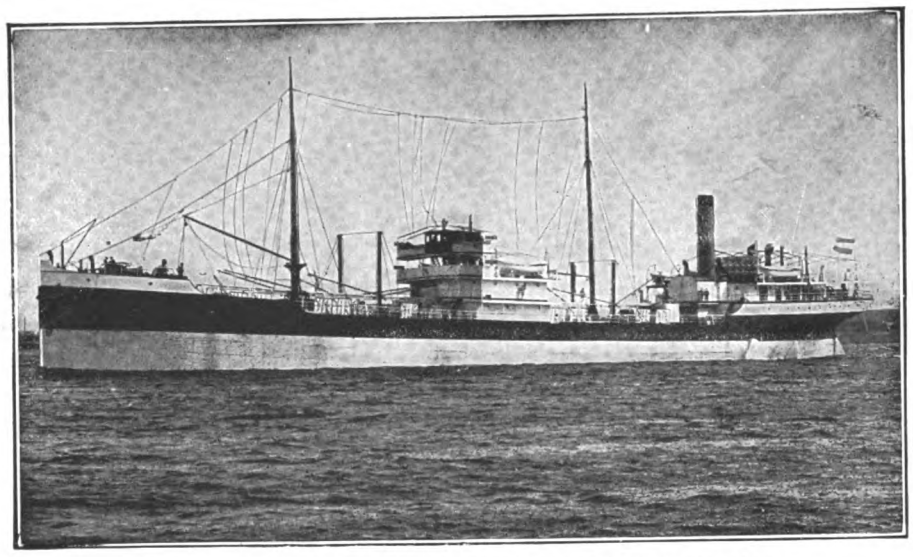

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BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N.Y., U.S.A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

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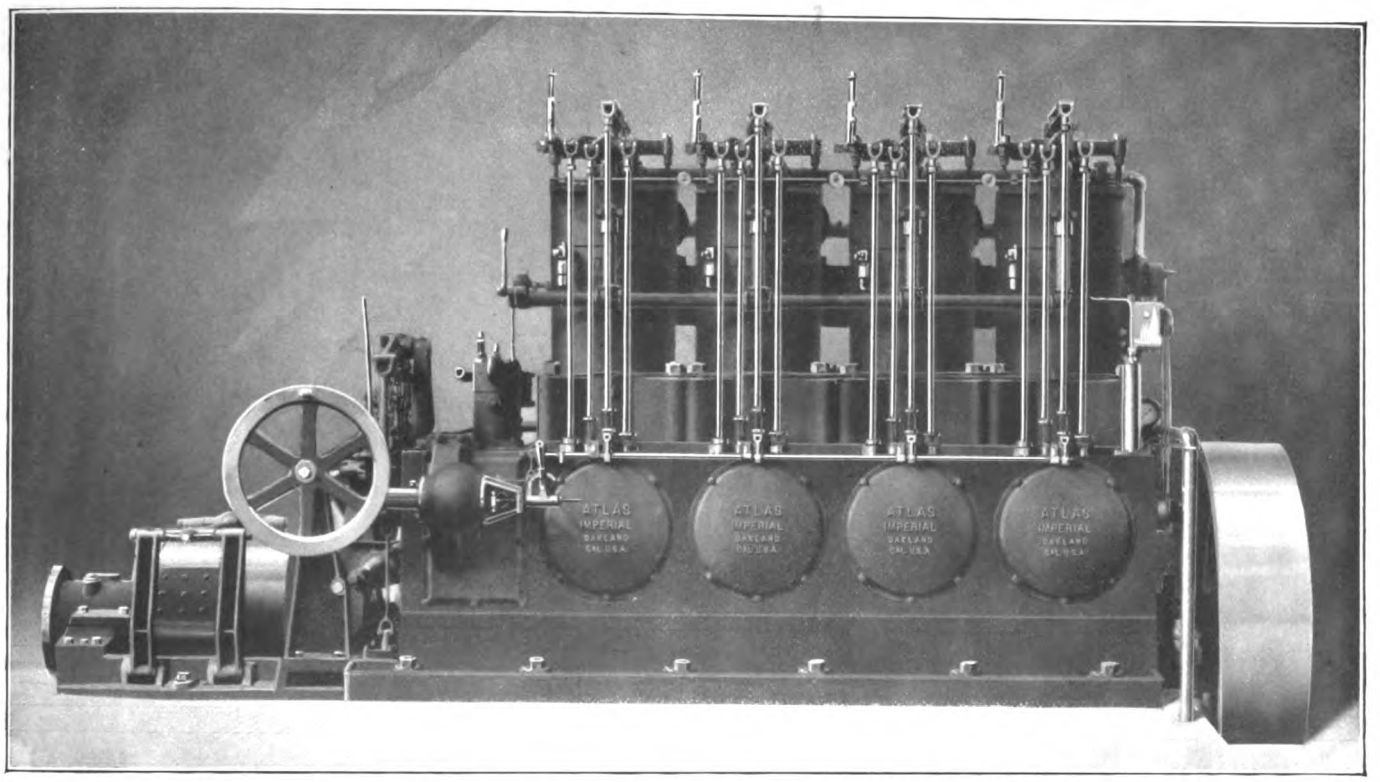

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BUILT IN 3, 4 and 6 CYLINDER TYPES 55 TO 500 HORSE-POWER

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To users of Gas Engines:

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Now it does not take much running each day to burn up the price of our Diesel-engine in your gas-engine.

Our Mechanical-Injection Diesel-engine has about 20% less repair expense than a gas-engine, is easier and more simple to operate than a gas-engine and absolutely dependable.

The actual cost of operation is $0.0032 per horsepower hour with fuel-oil at 6c per gallon and $0.0005 per horsepower hour for lubricating-oil at 50c per gallon. This is equivalent to 37c per hour for 100 horsepower.

Now be fair with yourself and consider this matter. Figure out your *loss* yourself, or send us the power of your engine, time operated each day and the fuel-consumption, and our engineering department will submit reliable figures to you showing the amount of money you can save by putting in our Mechanical-Injection Diesel-engine; furthermore, we will guarantee our statements.

For over 30 years we have been designing and building internal-combustion engines, and air-injection Diesel-engines for eight years. Our air-injection engines are working in all parts of the globe and giving excellent service and satisfaction.

Our Mechanical-Injection Diesel-engine, as the name implies, injects the fuel into the combustion-chamber by mechanical means, where it is ignited by the *heat of compression only, no hot-points, balls, or surfaces of any kind,* and the maximum working-compression is 350 lbs. per square inch. By this means of spraying the fuel-oil into the combustion-chamber we are able to eliminate all the high-pressure air and the expense, repairs, dangers and adjustments incidental to the use of high-pressure air for fuel-injection.

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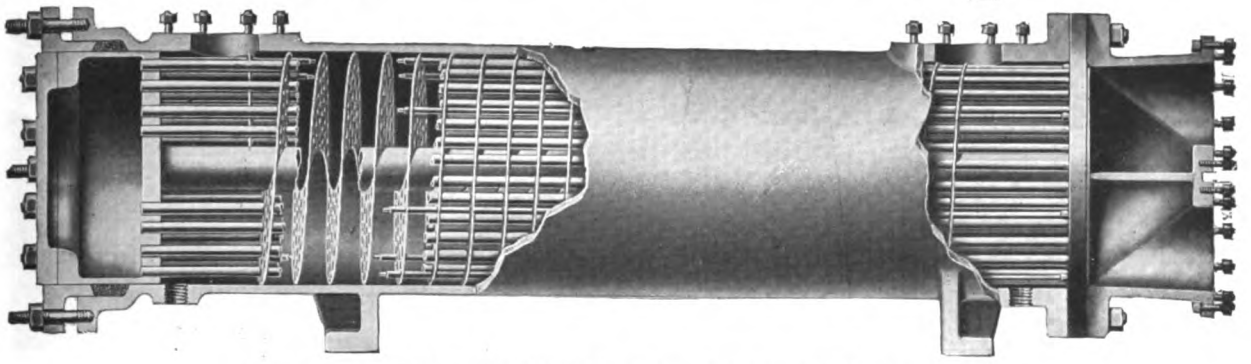
"the long, smooth oil path!"



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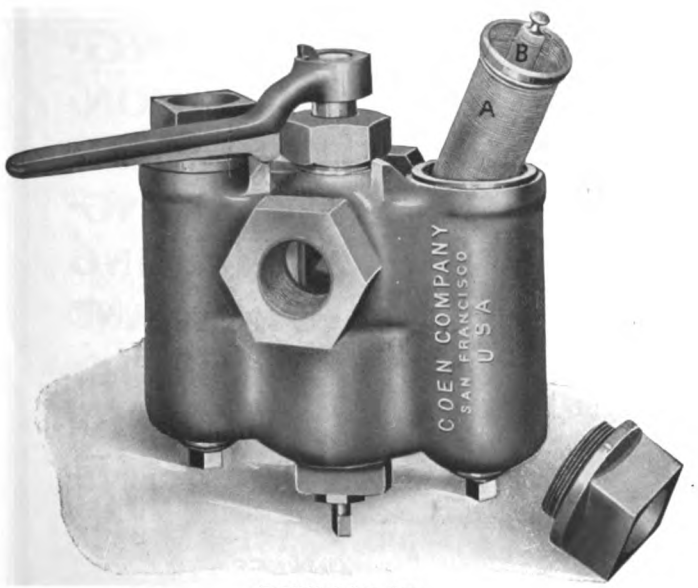

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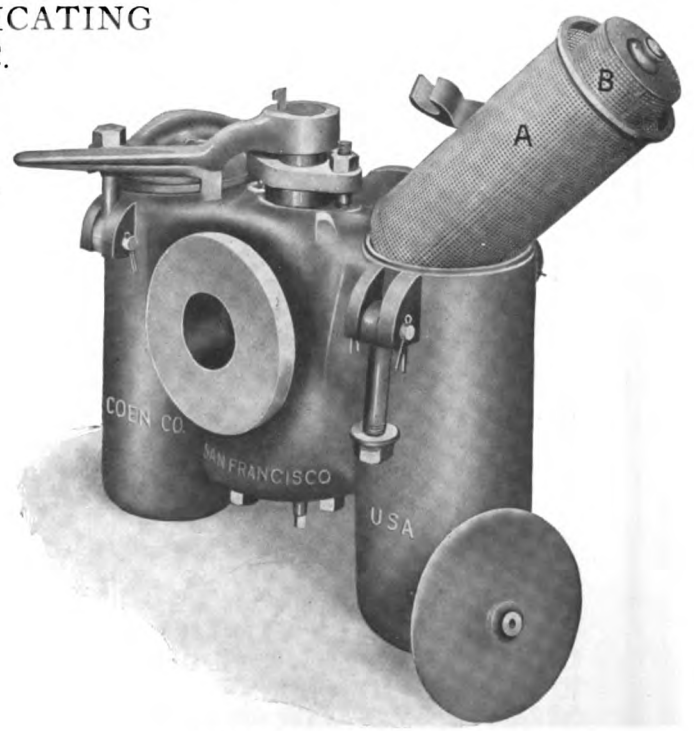

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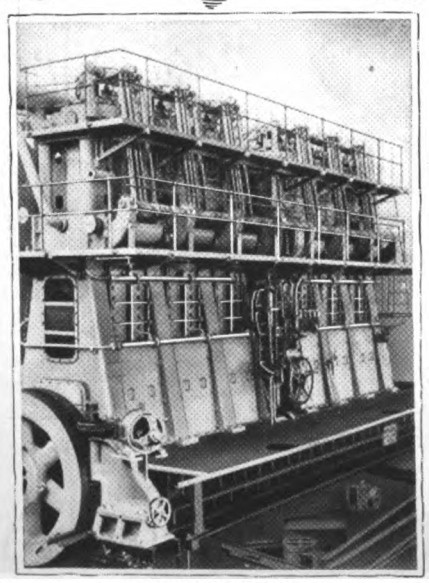

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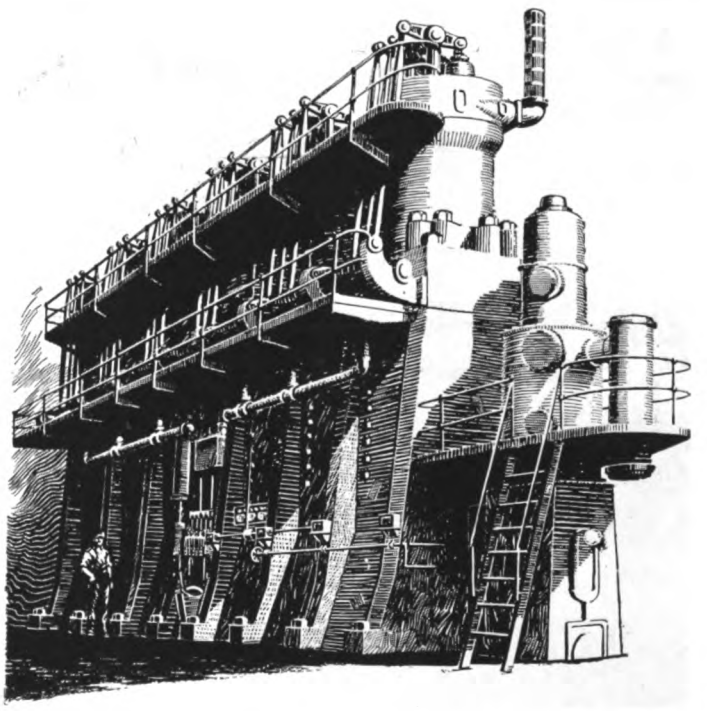

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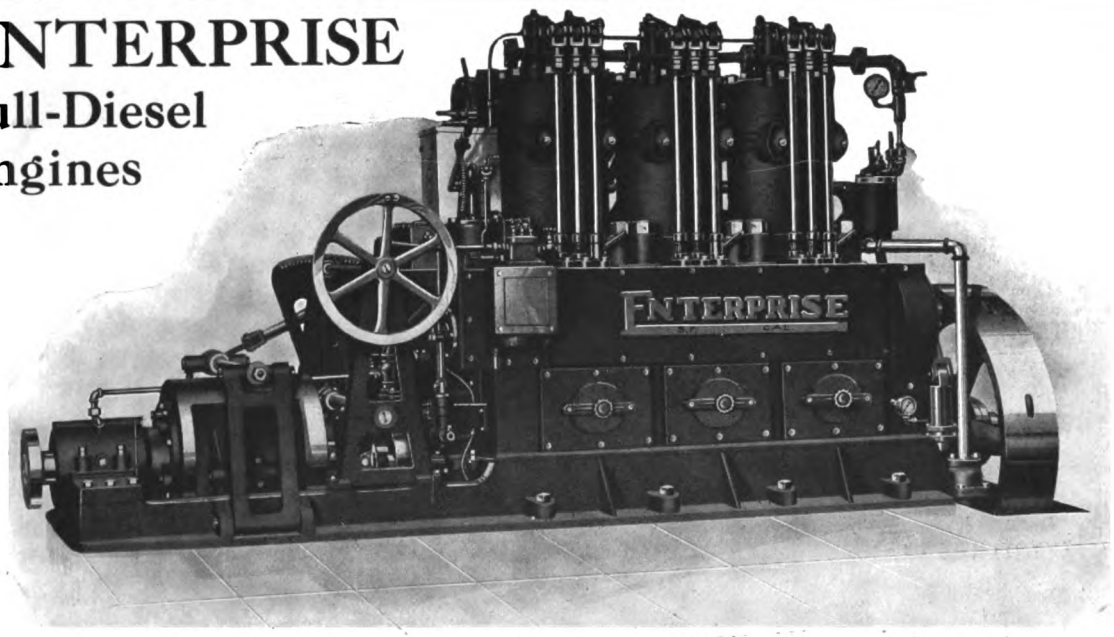

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This new Diesel has all the control, slow down and simplicity of the distallate or gas engine and none of the problems of electric ignition and carburetion. Is 40% heavier, more rugged in construction and will burn cleanly and efficiently oil ranging from 14° to 26° gravity.

Better Than a "Semi-Diesel"—

As compared to engines of the semi-Diesel or surface ignition types the Enterprise Diesel will burn much heavier fuels, burn them more cleanly; is more positive in action; more flexible, and, being of the 4-cycle type, is more economically and better lubricated. The exhaust can be piped through side of boat. Not only does it burn oil of lower gravity, but is more economical in consumption of this oil.

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As compared with engines of the air-injection Diesel type, the Enterprise possesses all the desirable features in the way of thorough fuel combustion; ability to burn fuels of heavy gravity; economy of lubrication and economy of fuel consumption without the use of high pressure air compressor. For its operation this engine requires no pressures to exceed 150 lbs. outside the cylinders.

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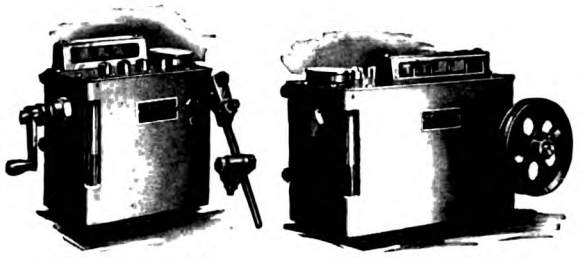

4 Feed Ratchet Oiler 5 Feed Rotary Oiler

"Manzel" Oilers are made in sizes and styles to fit any engine.

They can be furnished with any number of feeds; with rotary, ratchet, or direct lever drive; large or small reservoirs; polished brass or painted finish.

There is a Manzel Oiler to meet your requirements no matter how large or small your engine may be.

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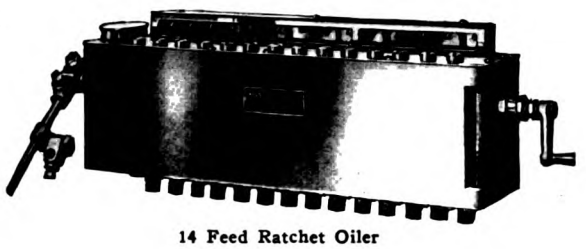

14 Feed Ratchet Oiler

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Manzel Oilers are designed to lubricate the cylinders and bearings of Diesel and other heavy-duty engines in the most positive and economical way.

They are the result of more than twenty years experience in the manufacture of Force Feed Oilers.

Simple in design, but strong and durable, they supply the oil in just the right quantity where and when it is needed.

Each feed is regulated independently, and may be adjusted to supply the exact amount of oil required, no matter how much or little is needed.

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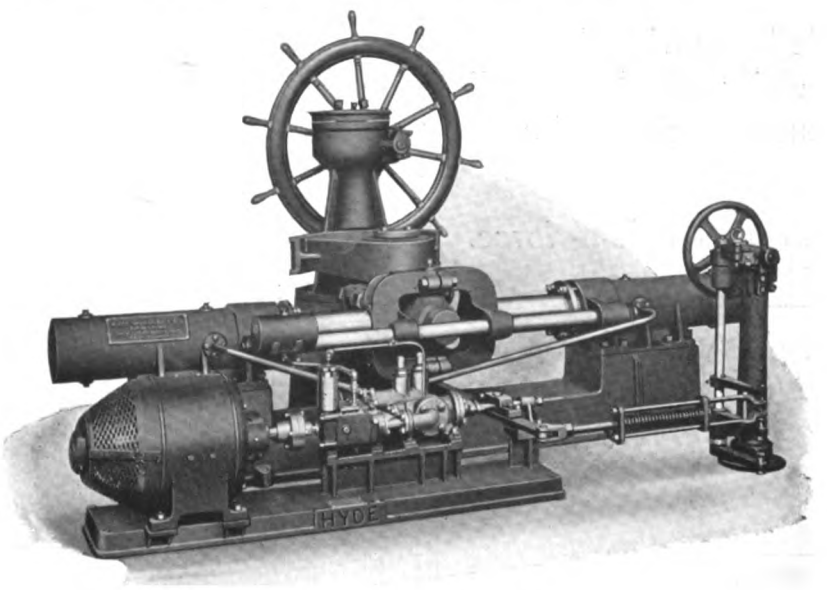
High grade marine auxiliary machinery and manganese bronze propellers



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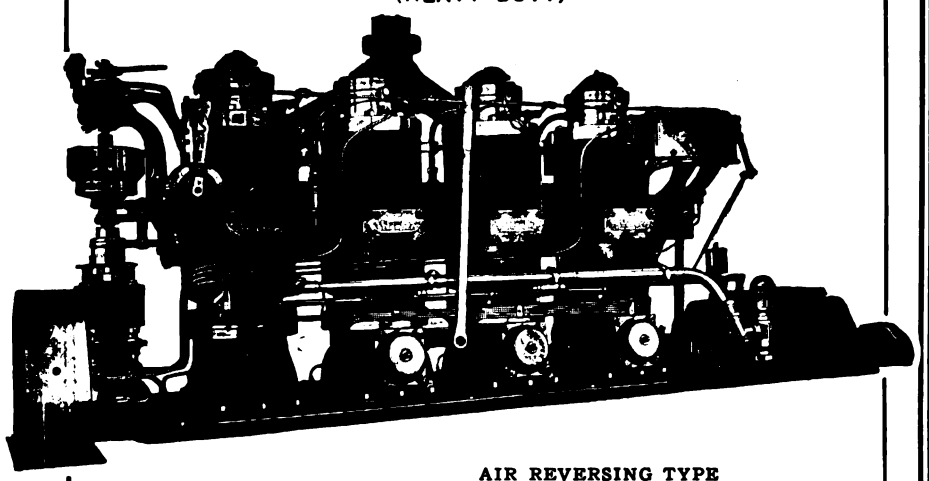
MARINE OIL ENGINES
(HEAVY DUTY)



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Absolutely reliable. Fuel consumption .55 lbs per H. P. hour.

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Two distinct advantages of all "Kahlenberg" Engines are:
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Write for our literature stating your requirements fully.

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"DIESEL ENGINE DESIGN"
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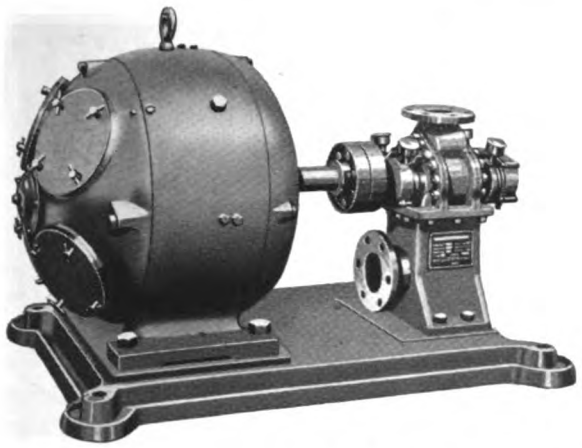

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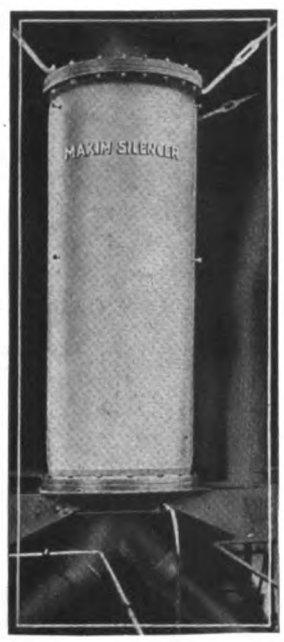

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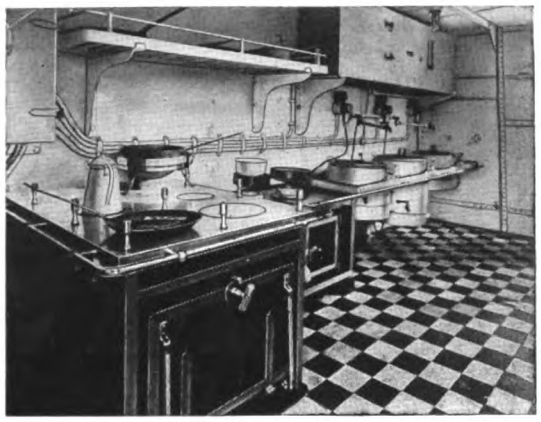

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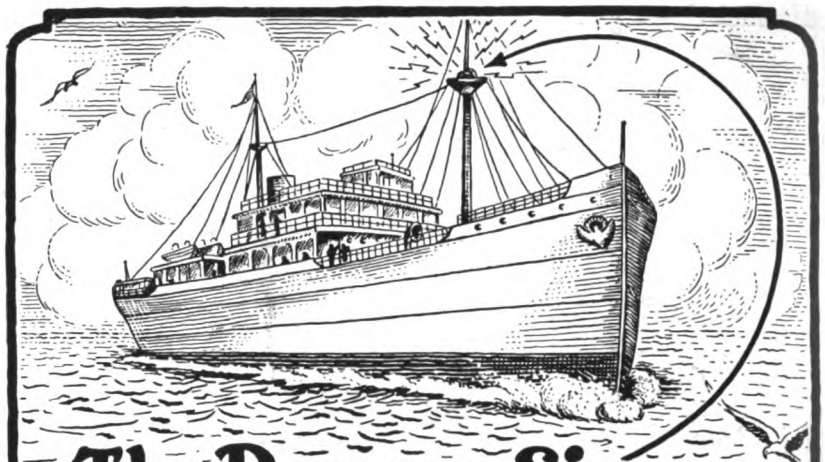

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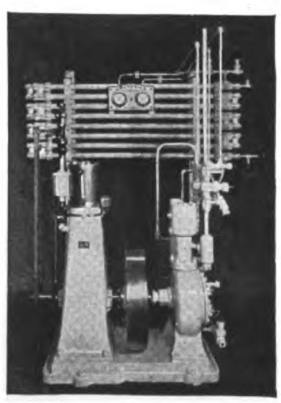

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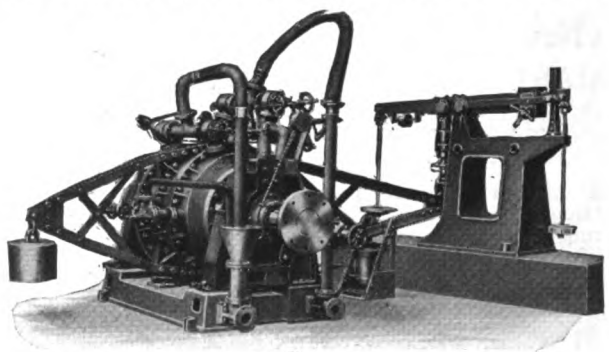

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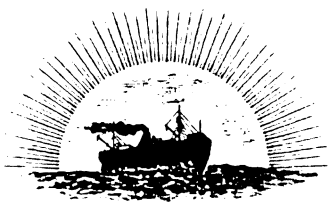

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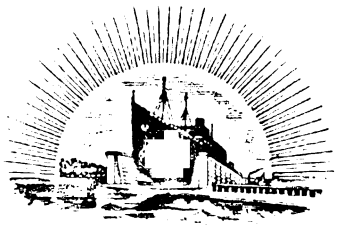

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Announcement

Important developments have recently been concluded in connection with the manufacture in this country of Internal Combustion Engines of the Opposed-Piston type, Messrs. William Doxford & Sons, Limited, of Sunderland, England, having completed arrangements with the Sun Shipbuilding Company of Chester, Pennsylvania, U. S. A., for uniting the interests of the American Junkers Patents with the Doxford Patents, which have been the basis of the developments forming the Doxford Opposed-Piston Two-Cycle Oil-Engine, so successfully built by this English firm.

The Sun Shipbuilding Company of Chester, Pa., have already secured the full license in America and its possessions of the Junkers patents, and it will operate both interests in America. An immediate start is to be made at the Chester Works on the construction of a four-cylinder, 3,000 H. P. Single-Screw installation, being a duplicate of the Doxford manufacture, two of which engines are already at sea in the Motorships, "YNGAREN" and "DOMINION MILLER", and which are giving the very finest results in durability, continuous running, and with a remarkable fuel-economy.

This type of engine opens up with the brightest expectations question of installing Single-Screw Diesel-Engines for all types of boats up to very large tonnage.

Hitherto, one of the chief obstacles in the wider adoption of the Diesel-Engine for marine propulsion has been the fact that a Horse-Power of a very low limit could only be dealt with in Single-Screw and the cost of changing the stern and whole interior arrangements of the vessel from a Single-Screw to a Twin-Screw caused the shipowner to hesitate whether he could afford to add to his investment the excessive cost of reconstructing and rearranging the after part of his ship and adapt it to a Twin-Screw.

With this SUN type of engine, its suitability for Single-Screw propulsion is unquestioned, and today cargo-boats of 10,000 tons are operating successfully at speeds of 11 to 12 knots on revolutions ranging from 70 to 80 R. P. M.

These are ideal conditions for efficiency and for adaptability to present steamships and there is every reason to believe that this will open-up and provide a condition that is going to make available a considerable amount of tonnage in which the machinery today is rather more than doubtful.

The Sun Shipbuilding Company, with their unrivaled capacity for building and for extensive repairs and conversion jobs, having changed the methods of propulsion in a number of vessels within the last few years, are now establishing the manufacture of this well-known and high-class engine which will place this country in the lead for developing this type of power and will undoubtedly add an immense value to the American Merchant Marine.

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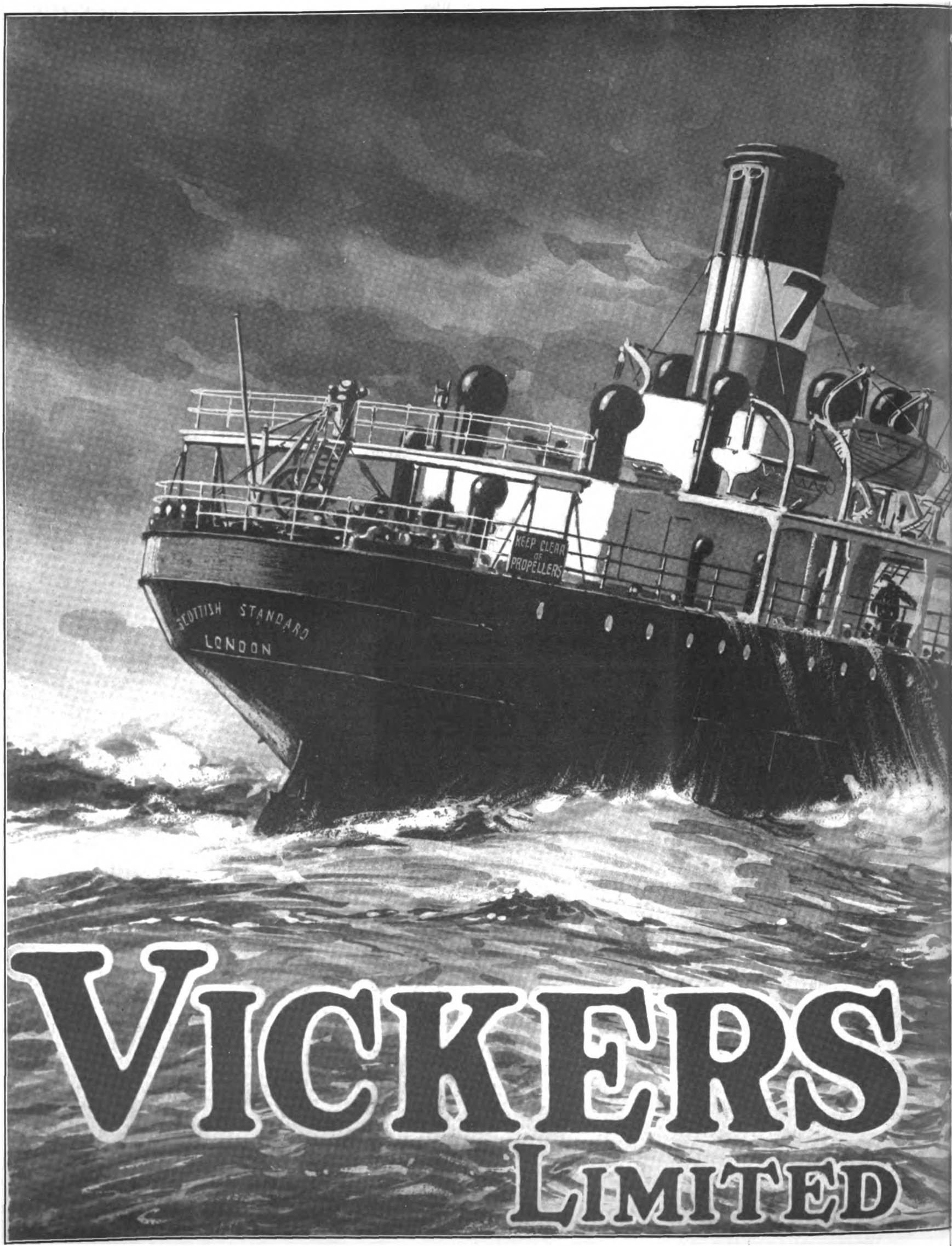

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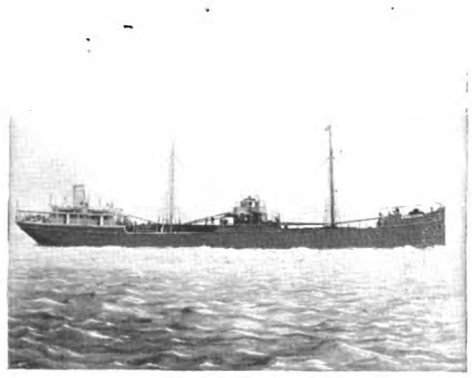

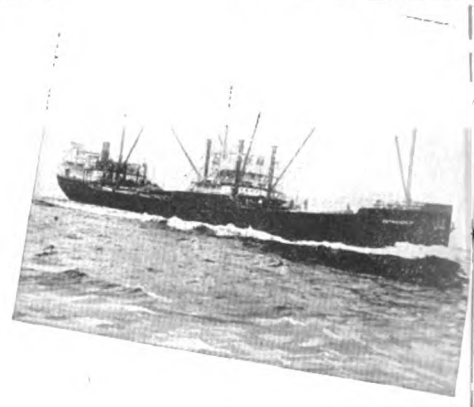

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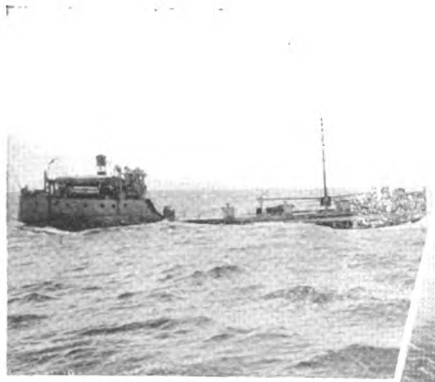
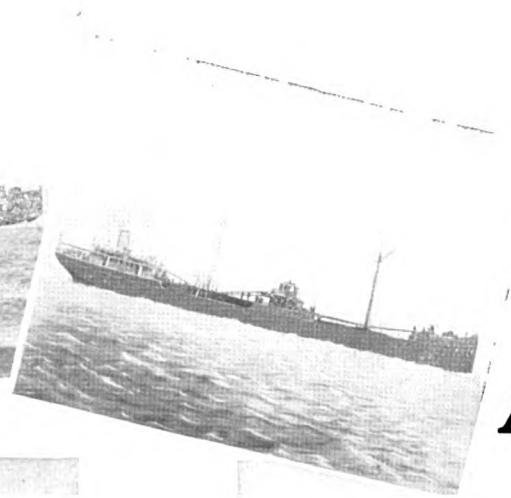

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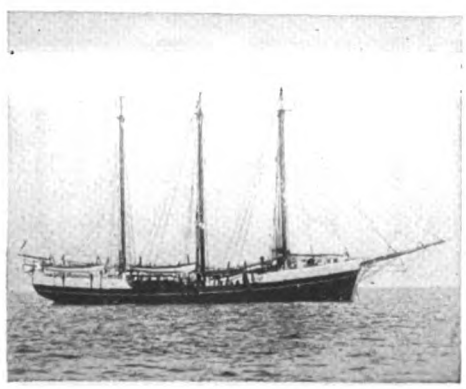

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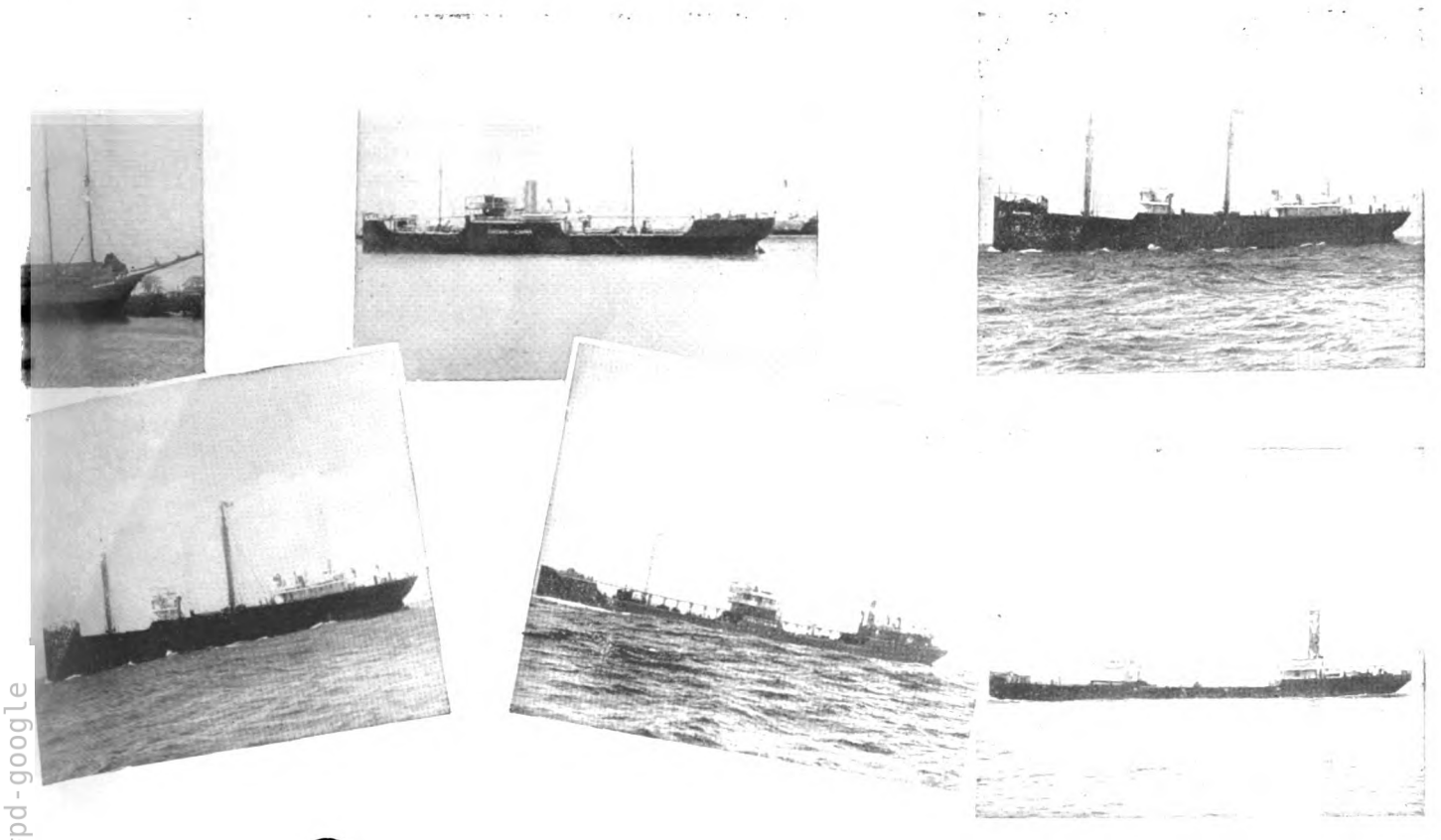

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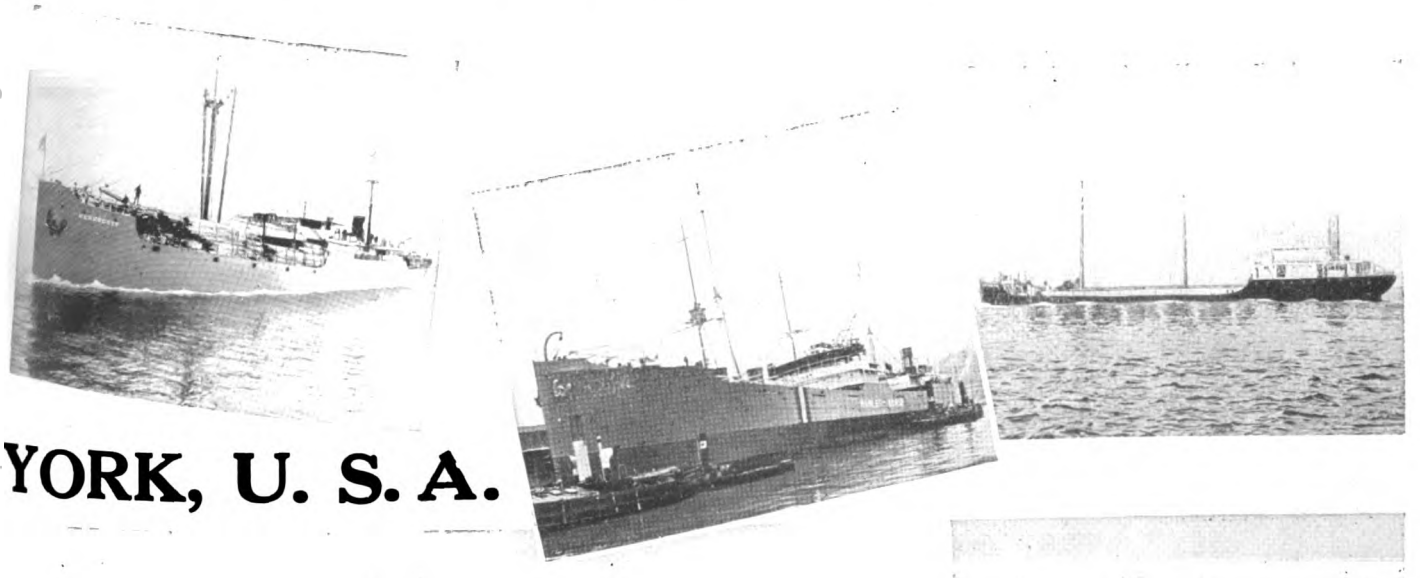

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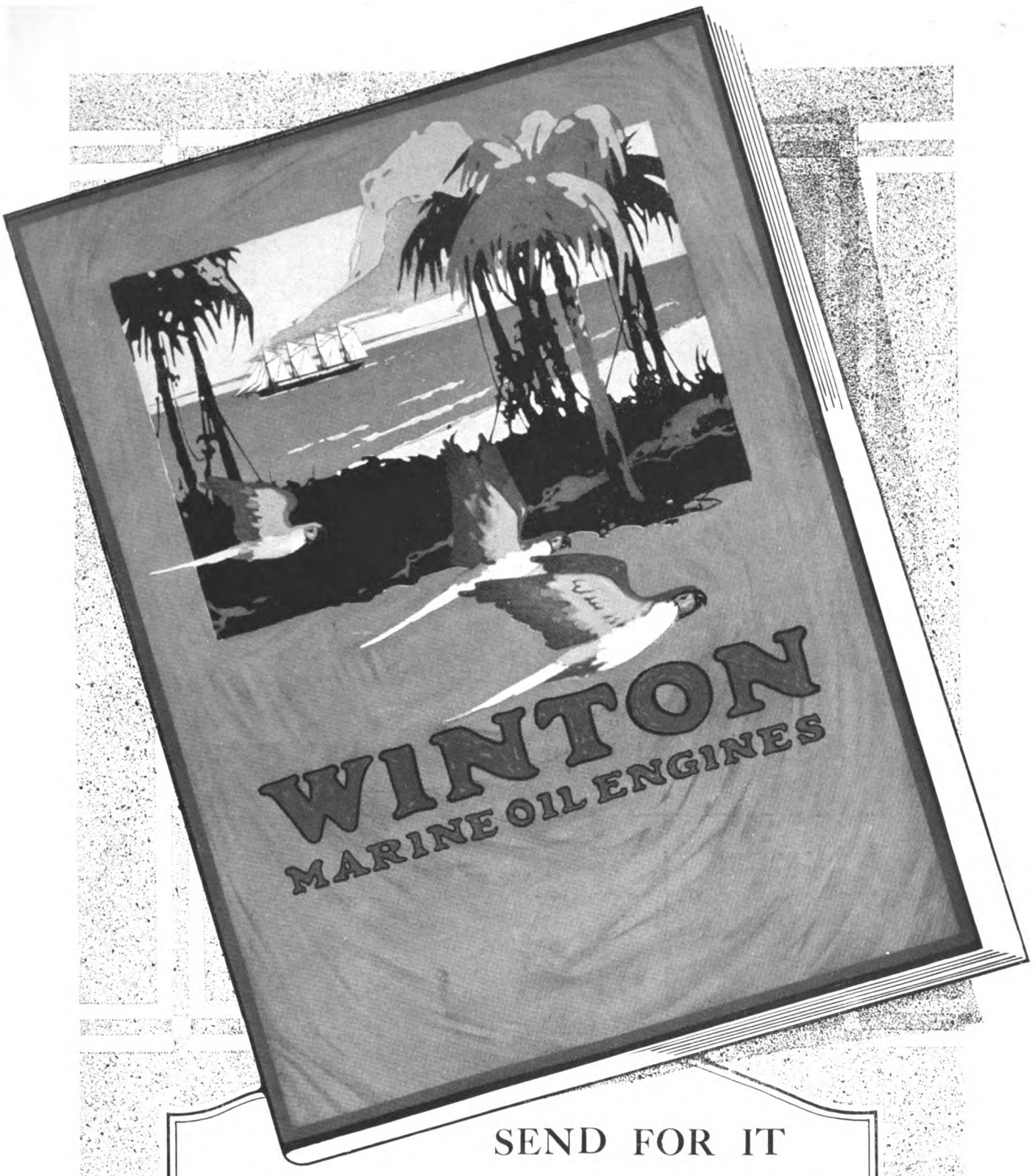

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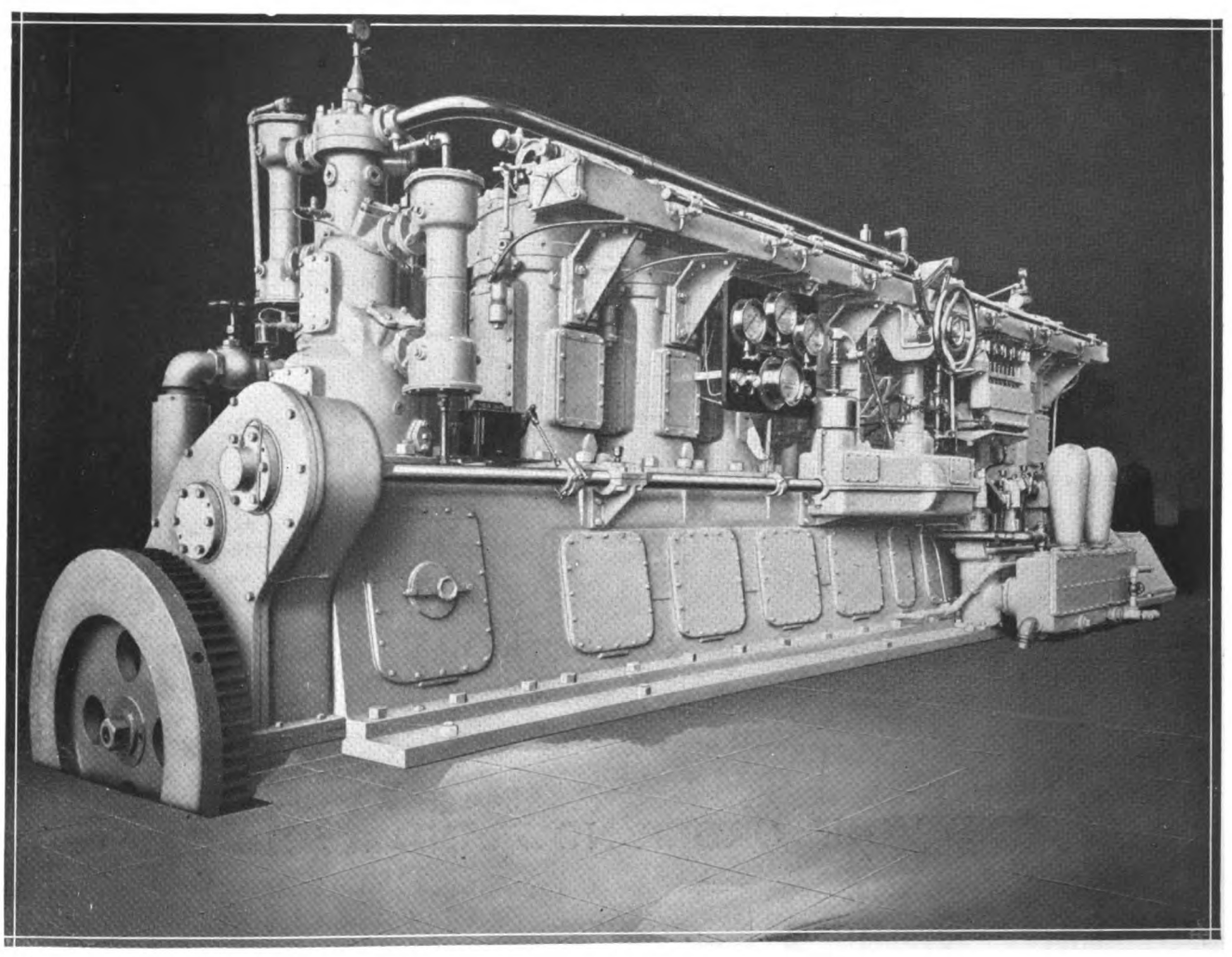

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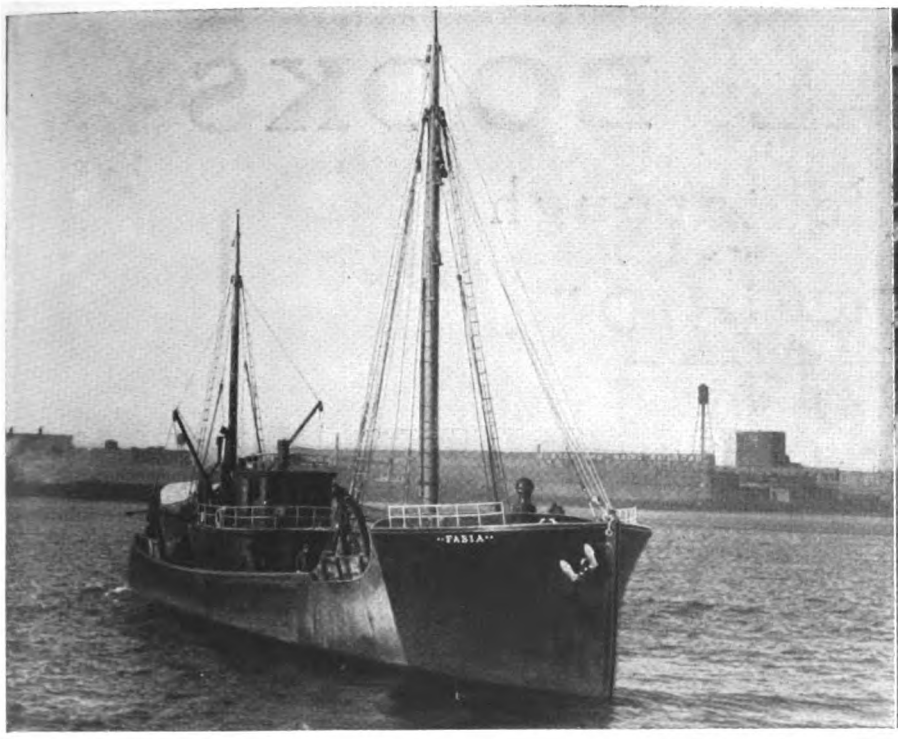

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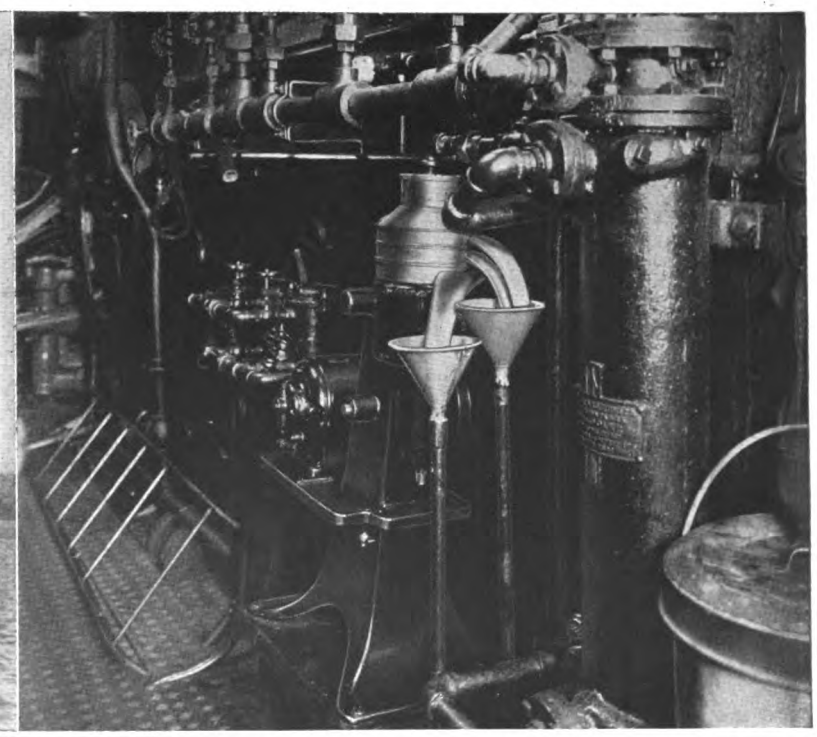

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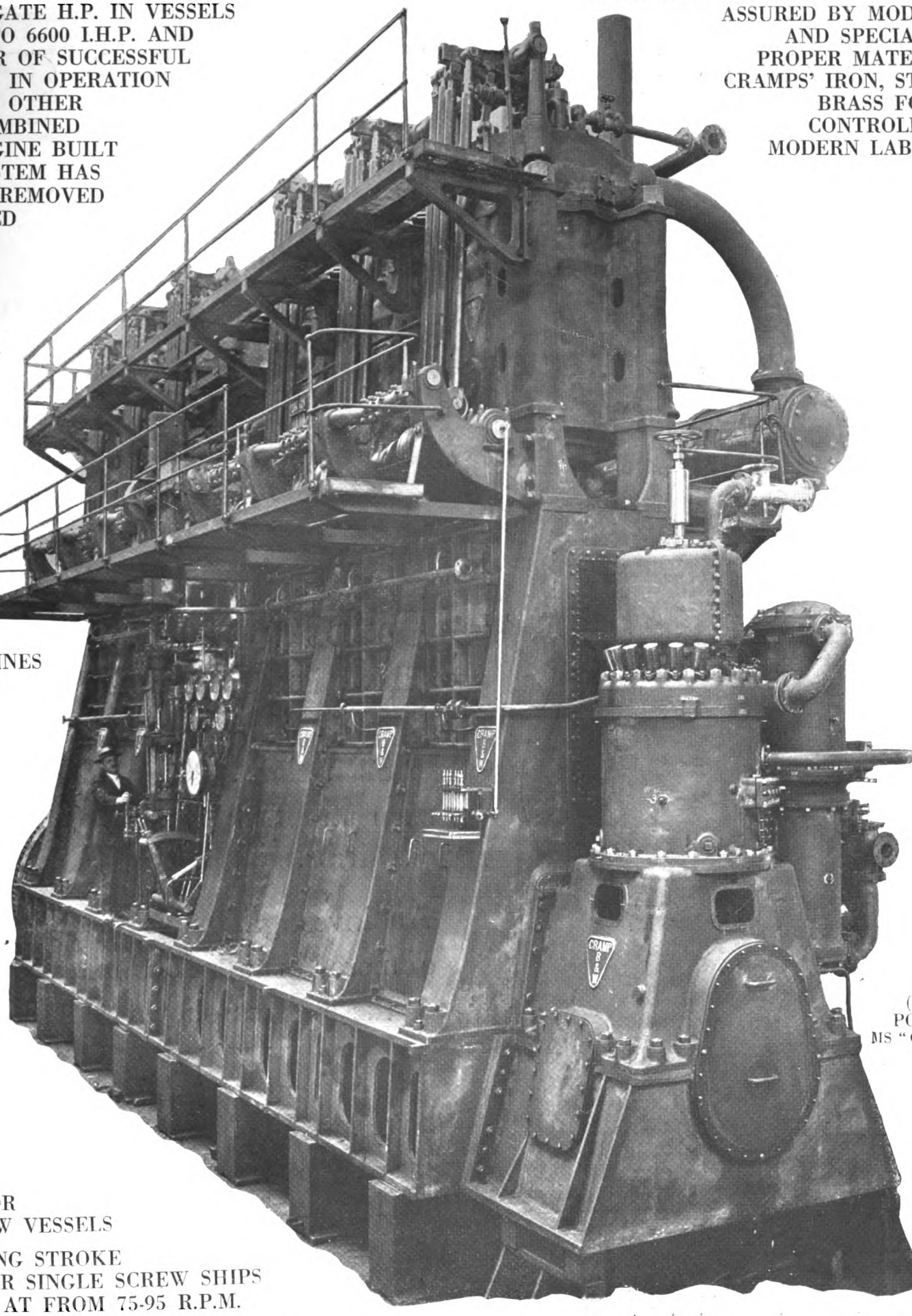

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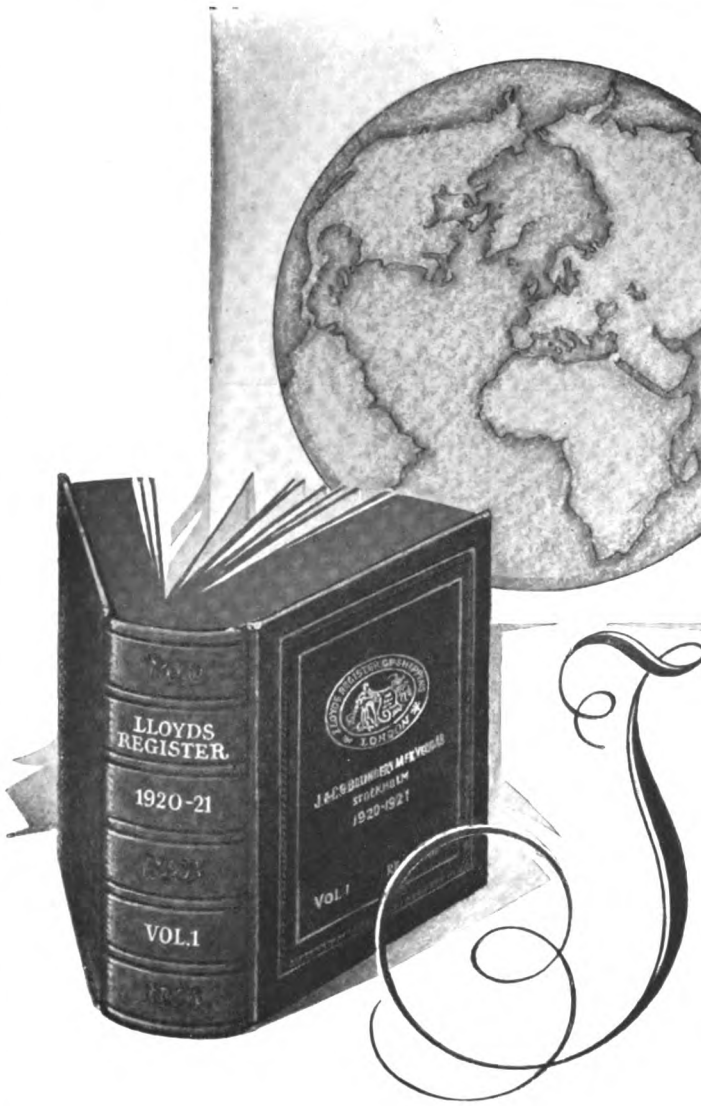

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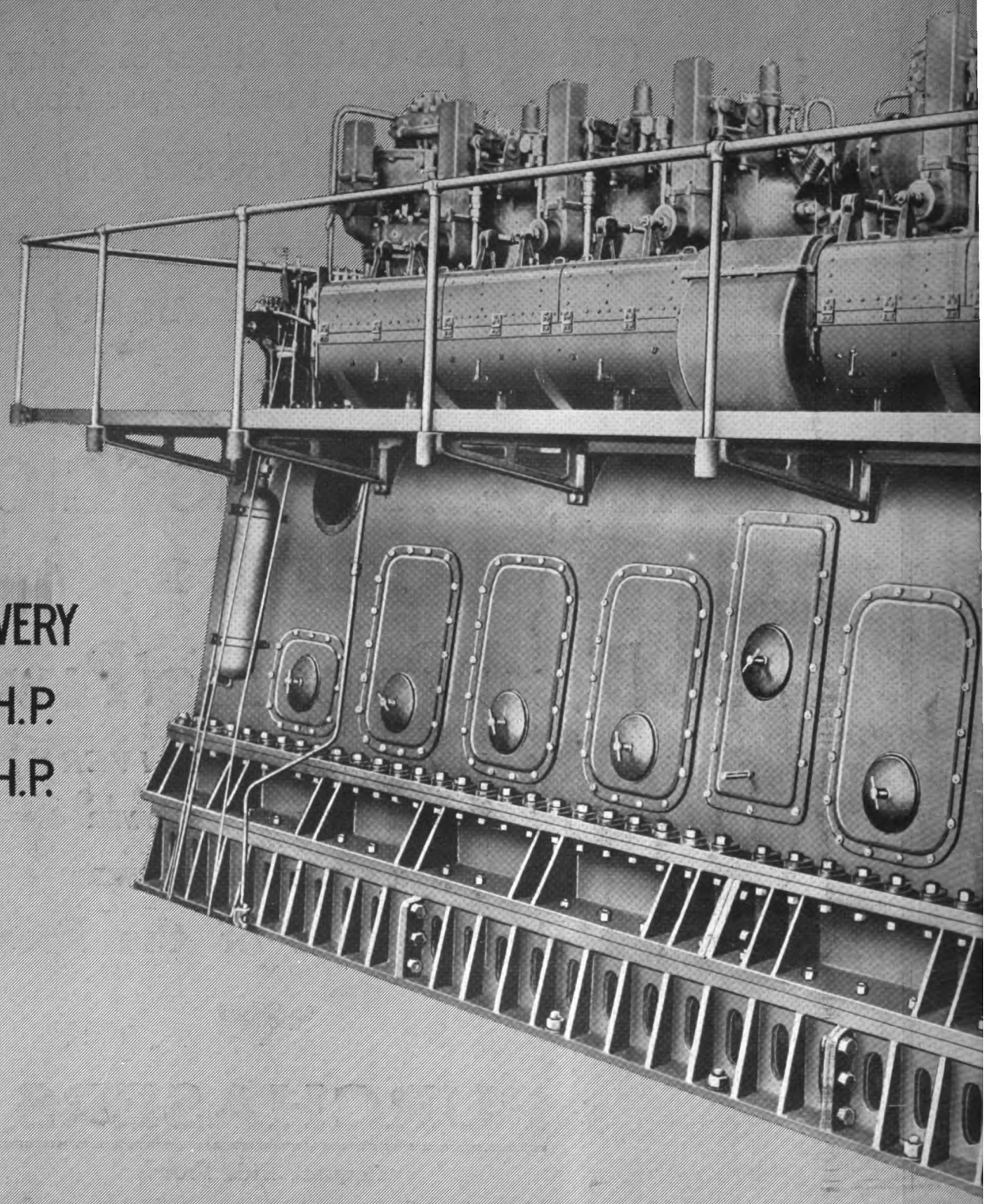
NELSECO DIESEL ENGIN



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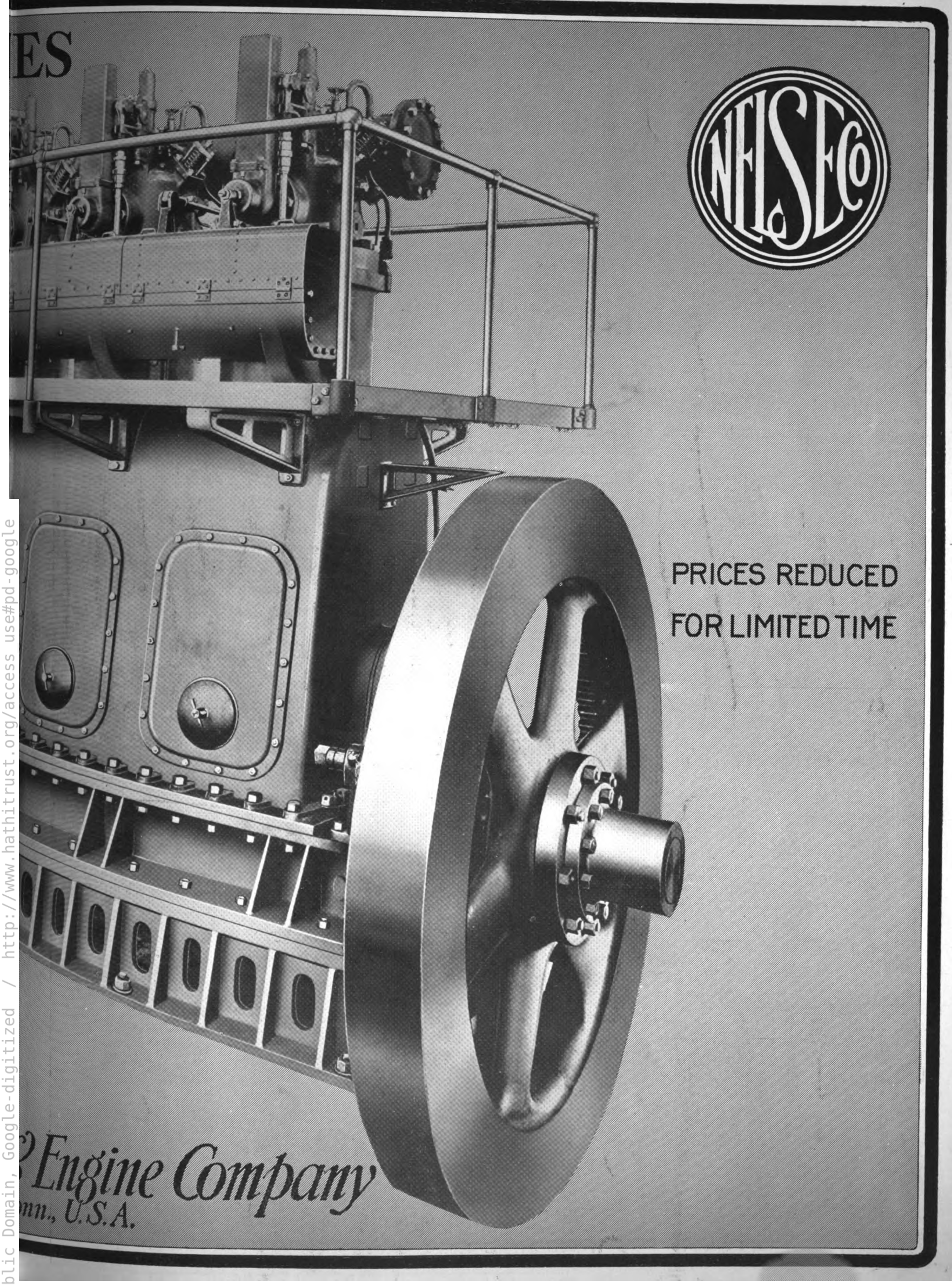

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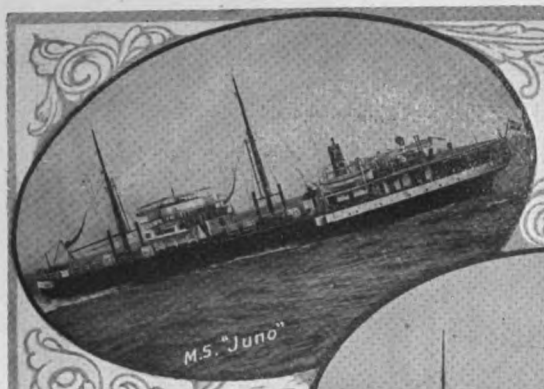
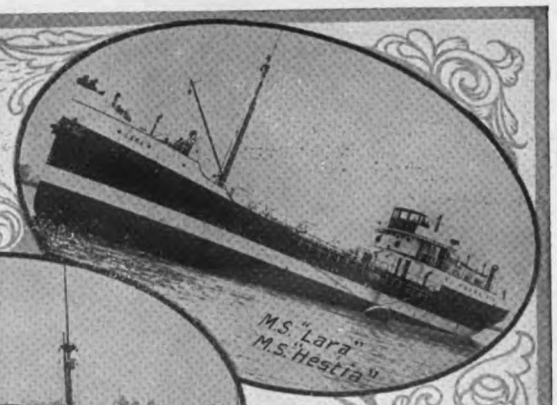
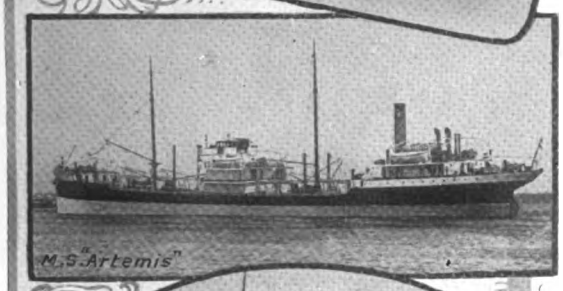
Some WERKSPOOR ENGINED MOTORSHIPS

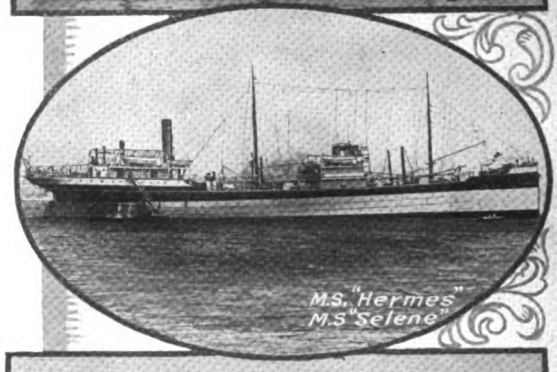






1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800



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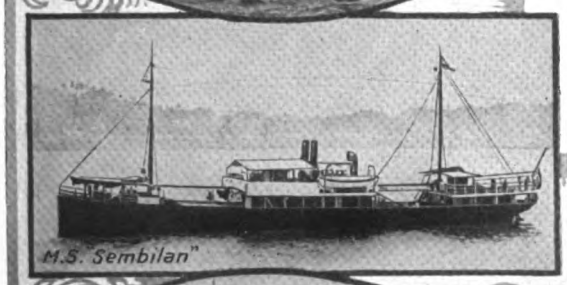

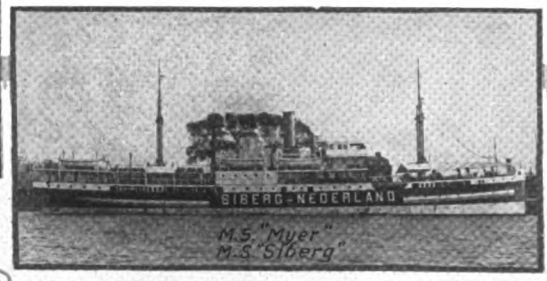

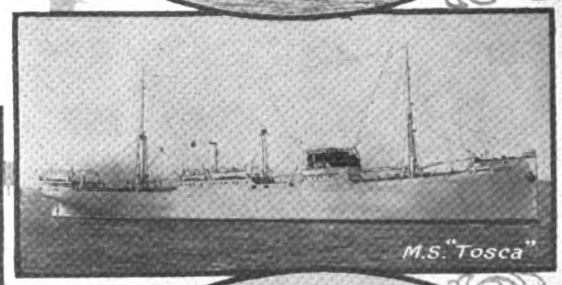

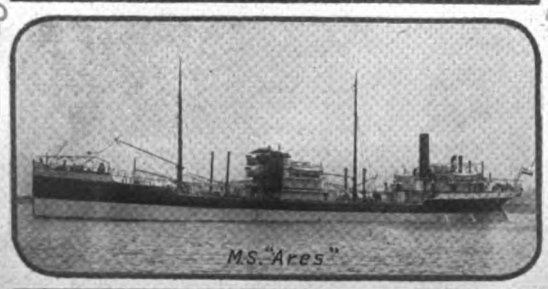

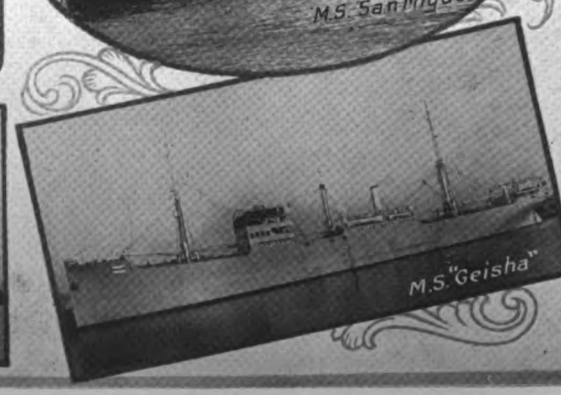

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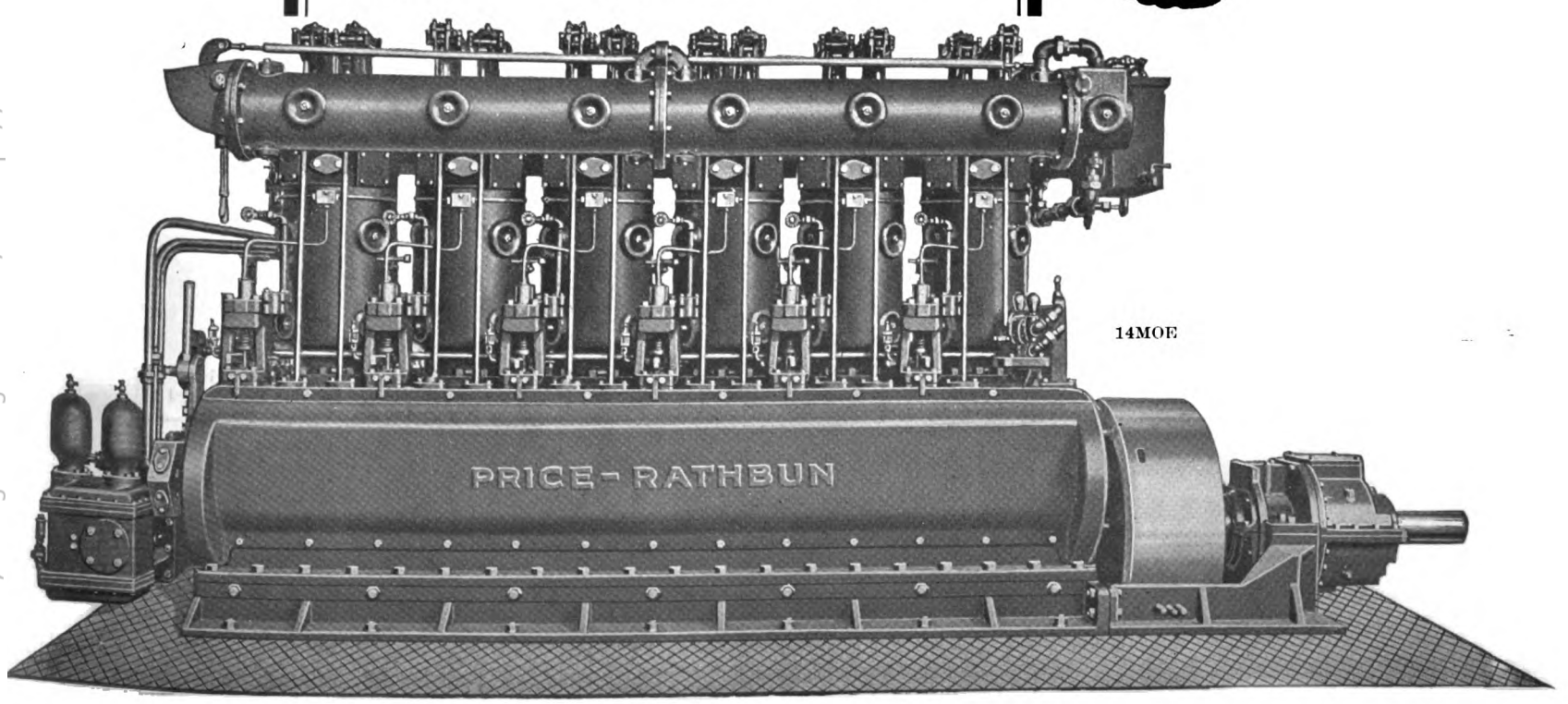

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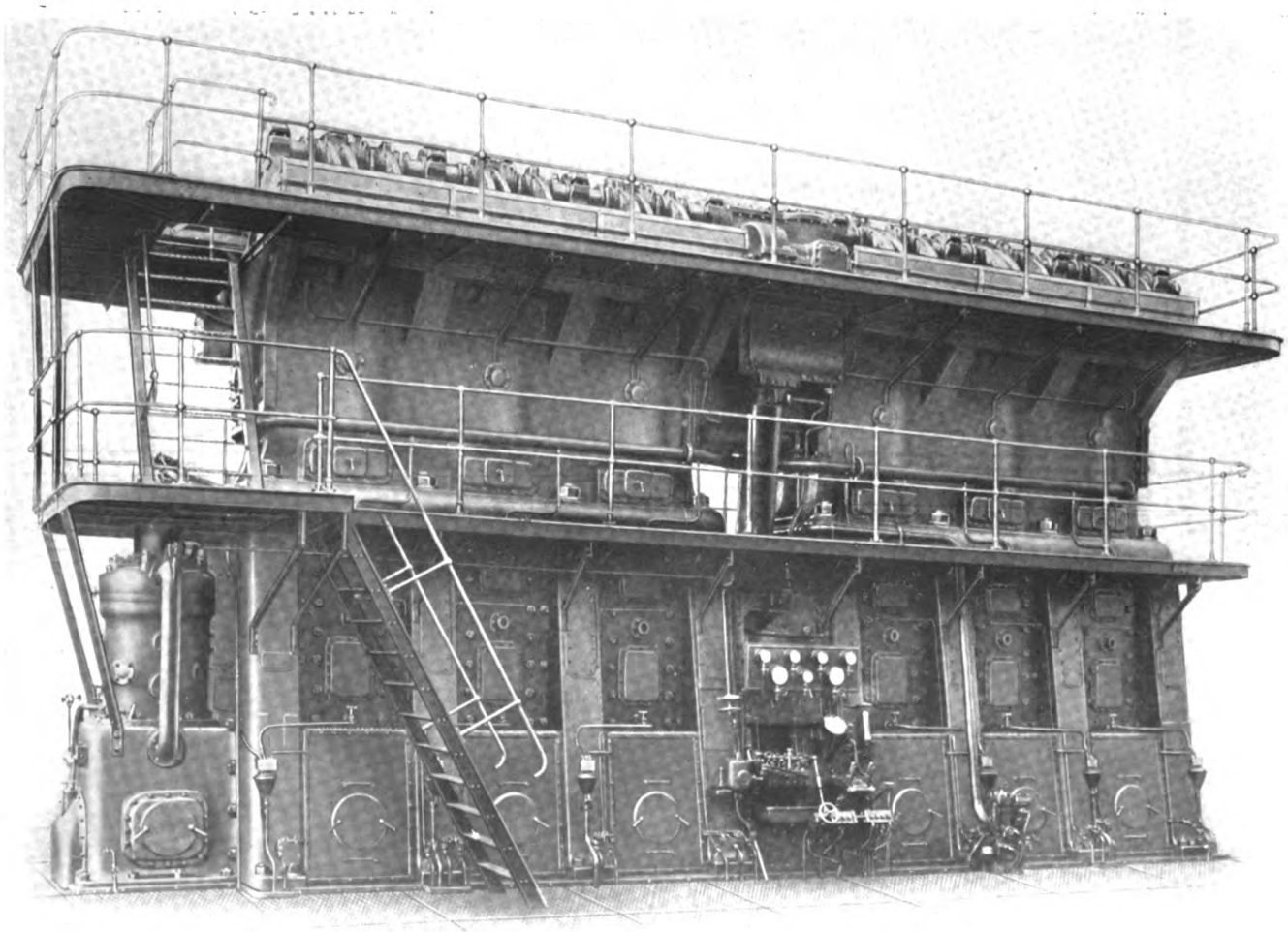

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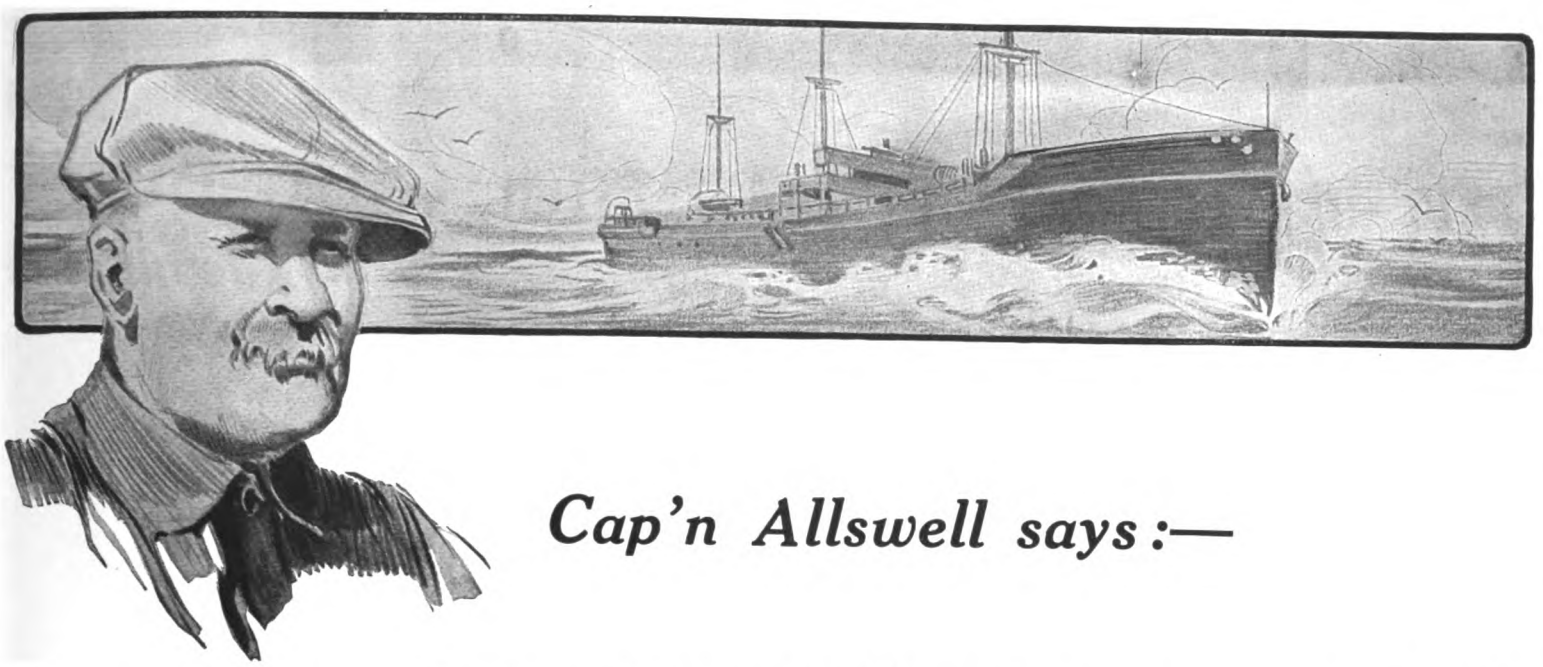

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"You know these Columbian Bronze Propellers are made of Manganese Bronze. They might bend, but they don't break."

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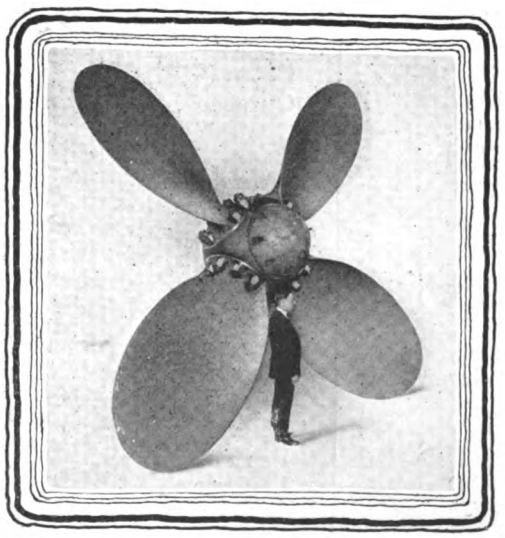

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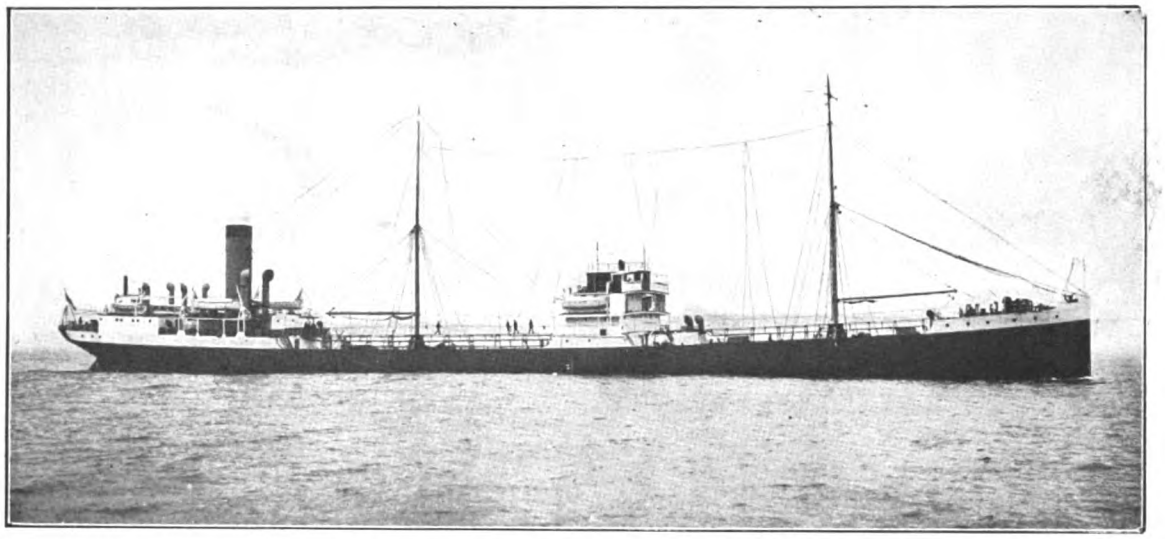

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HOW CAN AMERICAN SHIPS

An Expert Analysis of the Problems Facing Our Mercha

By WINTHROP L. MARVIN*

HOW can American ships compete successfully with foreign ships? It is a far-reaching question that is stated in these words, a question that goes right to the root of the life of our present-day merchant marine. For unless American ships can compete successfully with the ships of foreign nations, which still manage to dominate our own overseas carrying, there can be no future for ocean shipbuilding and navigation under the American flag. Therefore this question is one of as direct personal interest to naval architects and marine engineers of all grades and ratings in their pro to the shipowners and manag livelihood and succ ambitious Ameri problem of th Three ma time indu cessful eign o

any compreh of American merce, there construction building became a been convinced that in of the American oversea emphasis has been plac to steam and from wo is true that, in the p ish iron industry was machine shops and ste couraged and strengthen policy of mail shipping subs ined with vigor and p steam services were driven ican shipowners and build mindful of the advantages n hulls as some of the our ocean shipping have steamer Bangor was thoroughly effici between 1850 on the Dela d, go

Factors In the Solution!

"Unless American ships can compete successfully with the ships of foreign nations, which still manage to dominate our own overseas carrying, there can be no future for ocean shipbuilding and navigation under the American flag."

A ship subsidy may ultimately be found necessary to the satisfactory solution of this important problem. And if it is, it seems that this subsidy should be one which will promote a more economical merchant marine and automatically reduce in amount the subsidy required.

Regardless of the course of action finally pursued, Westinghouse Engineers hope to aid in this worthy cause by providing ships of increased efficiency and greater carrying capacity—thus supplying the right groundwork for success.

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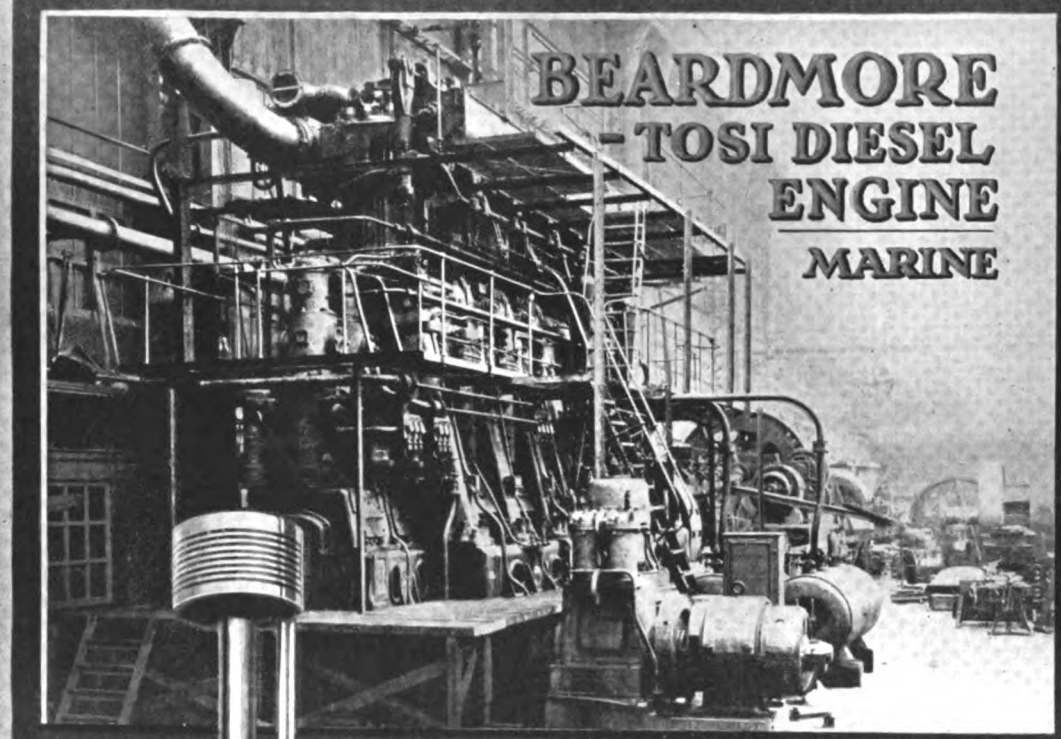
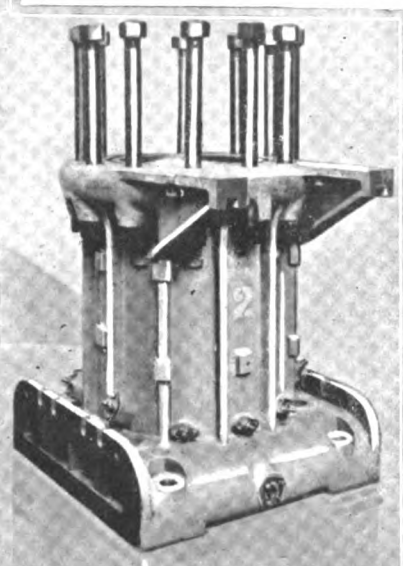
AND COMPANY LIMITED



PATENT VALVE GEAR

EXHAUST VALVE TROUBLES ELIMINATED

PATENT CYLINDER HEAD AND COOLING ARRANGEMENTS



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Results of 100 Hours' Trial

Average B. H. P.	1,276
Mechanical efficiency, per cent	77
Average I. H. P.	1,646
Revolutions per minute	124
Mean pressure on B. H. P. basis, lb. per sq. inch	75.5
Fuel consumption, lb. per P. H. P. per hour	42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. F.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average	125
Piston cooling water, outlet temperature deg. Fah., average	130
Blast air pressure, lb. per square inch	1,000

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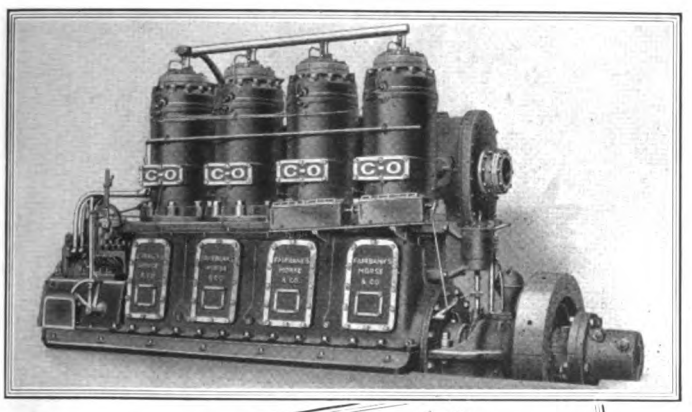

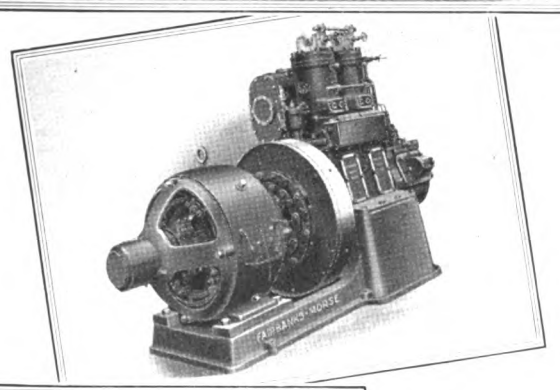

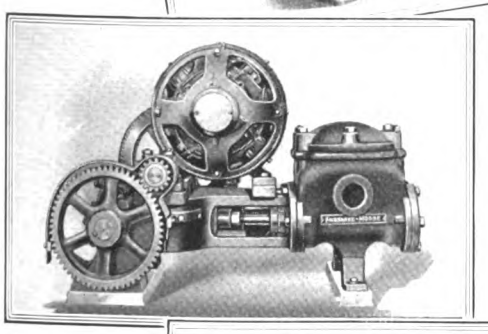

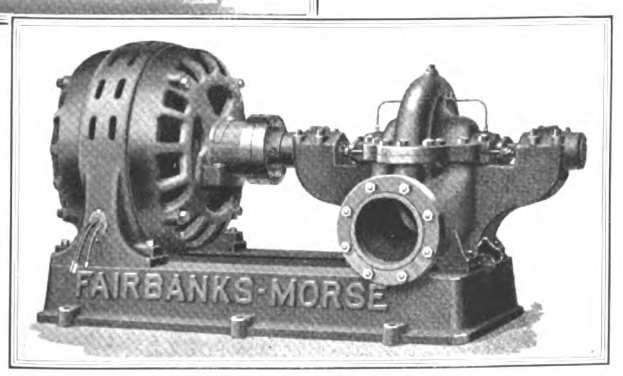

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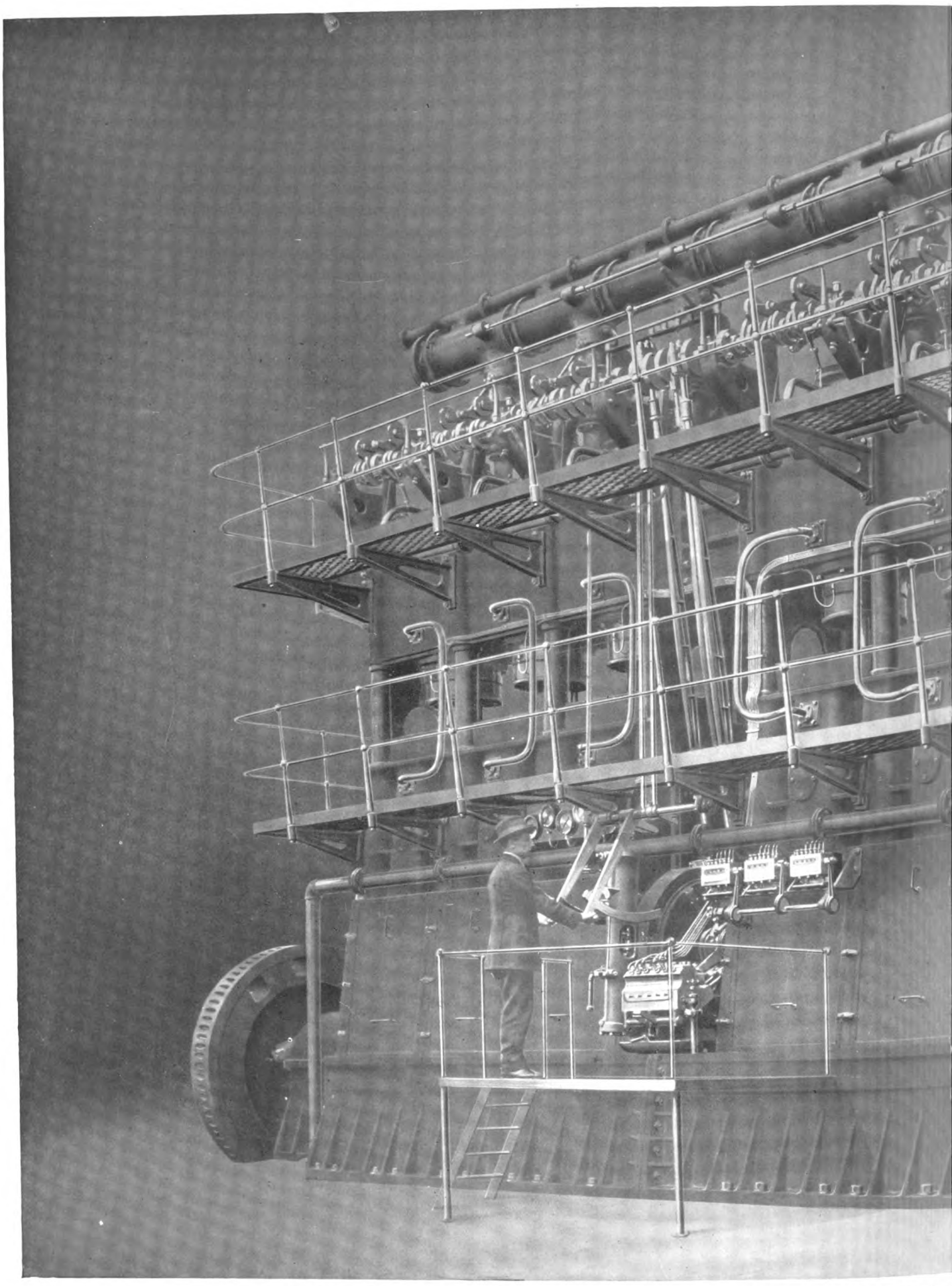

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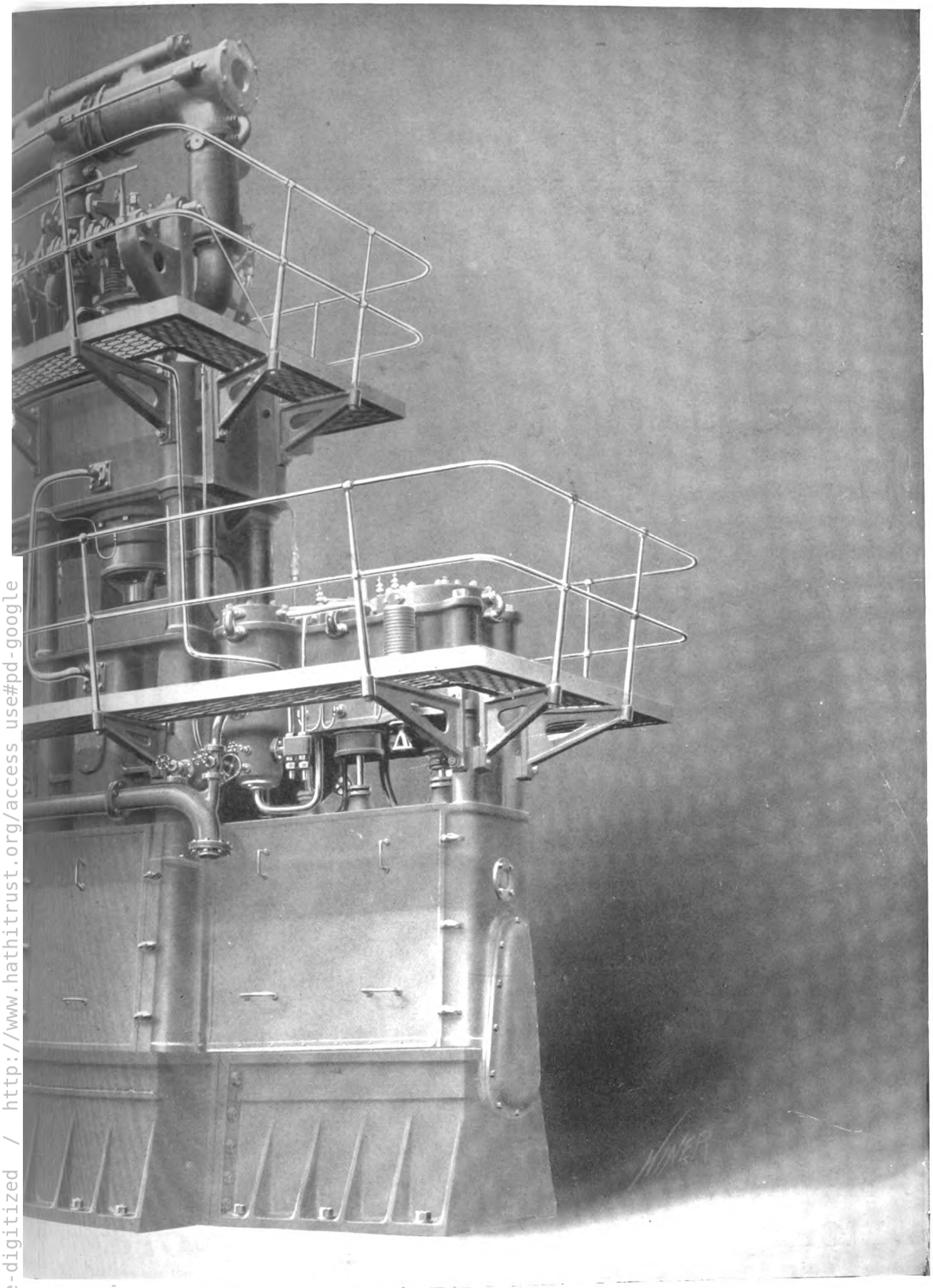

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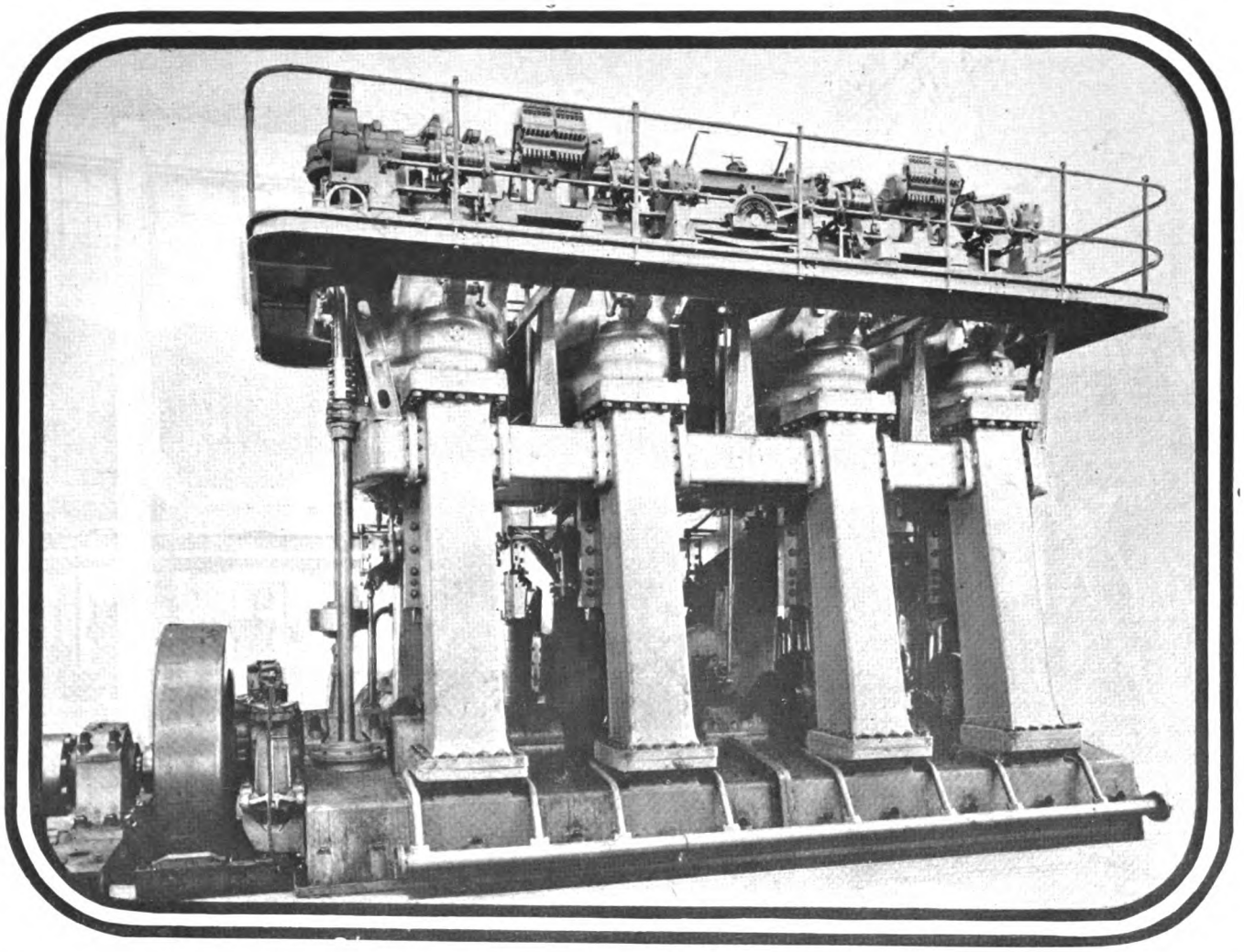

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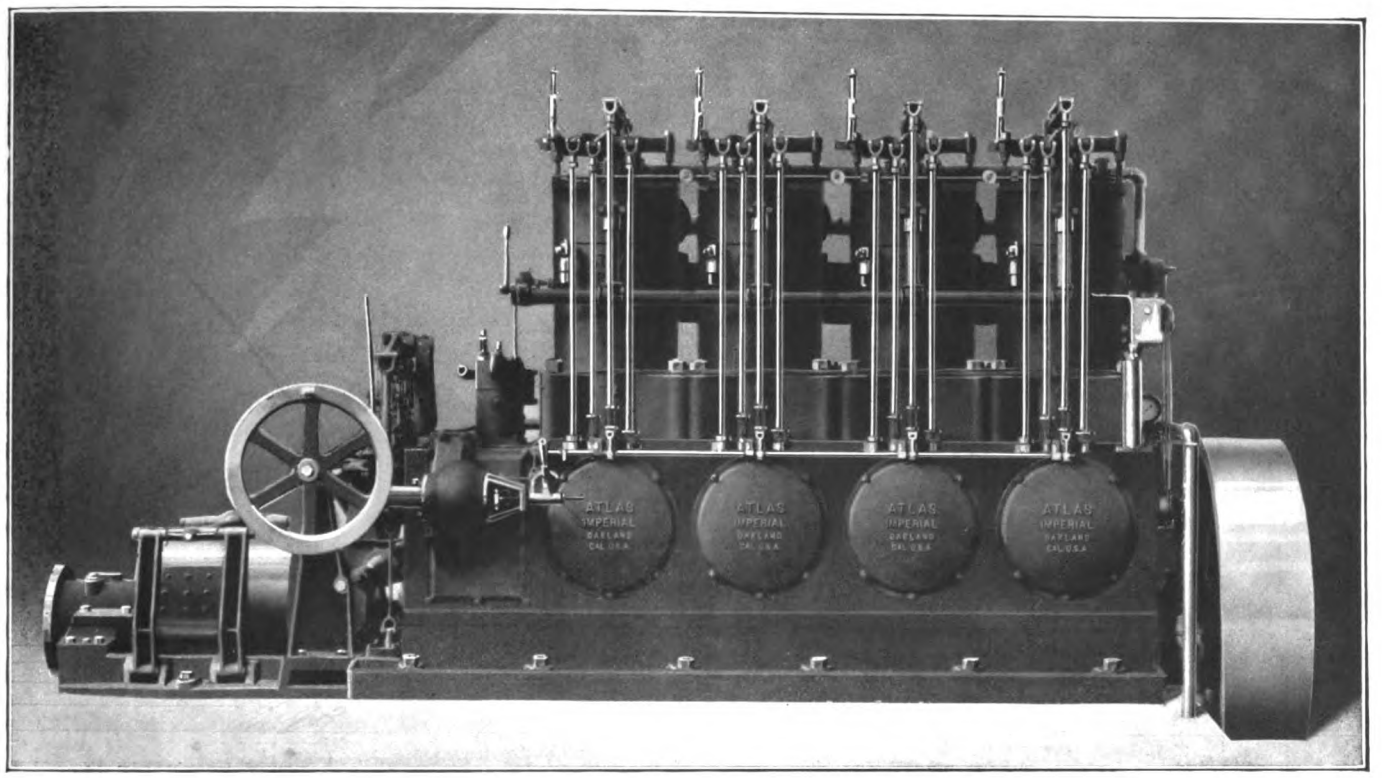

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GRADE OF FUEL:	Any grade of fuel-oil is used that will flow readily through the pipes to the engine.
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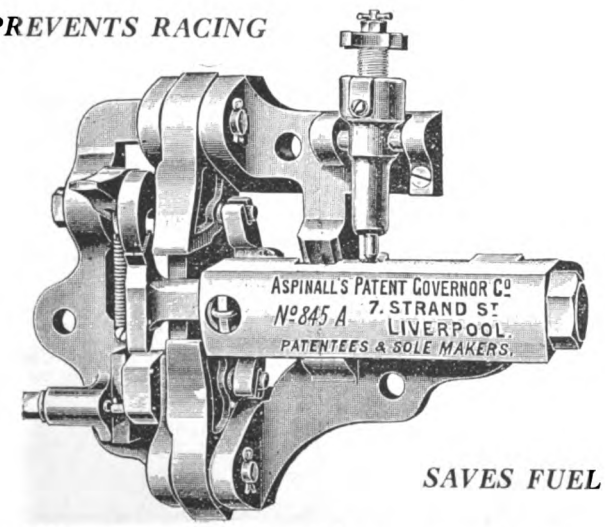

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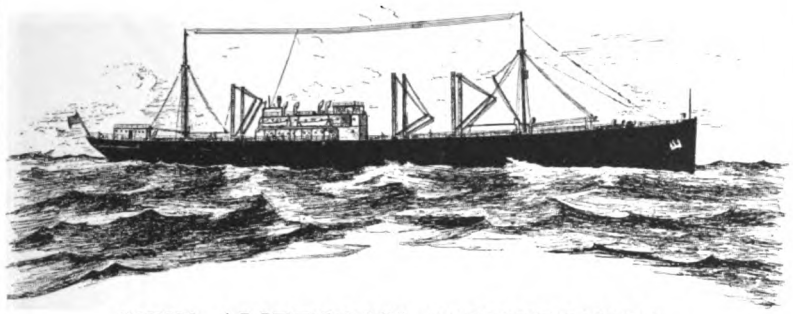

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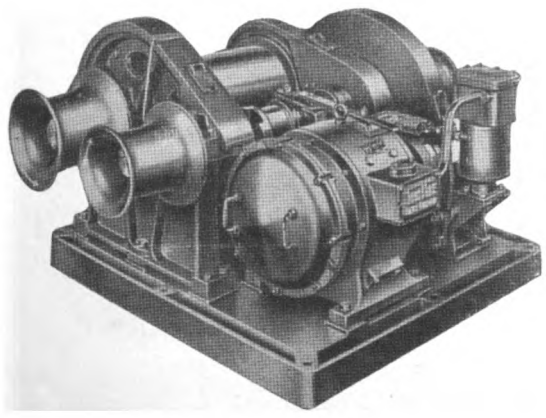

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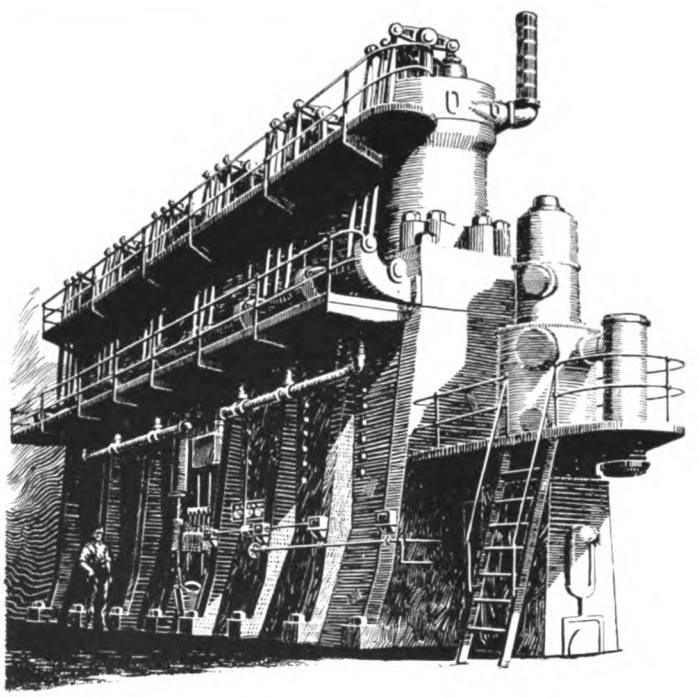

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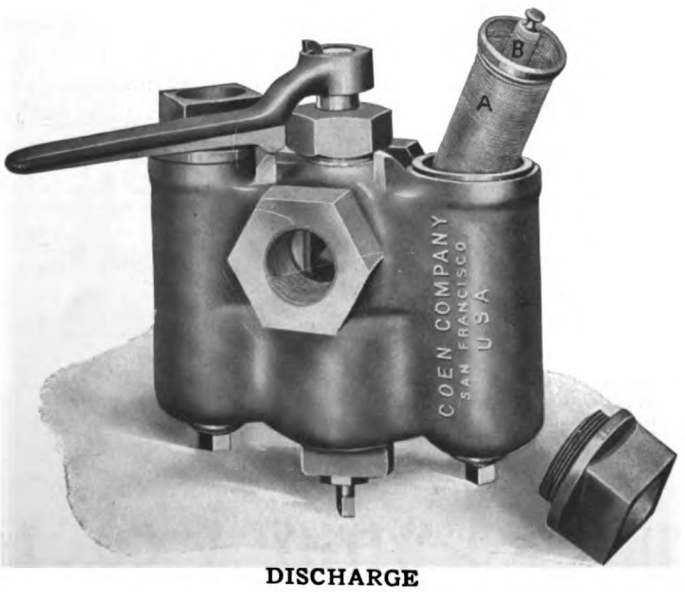

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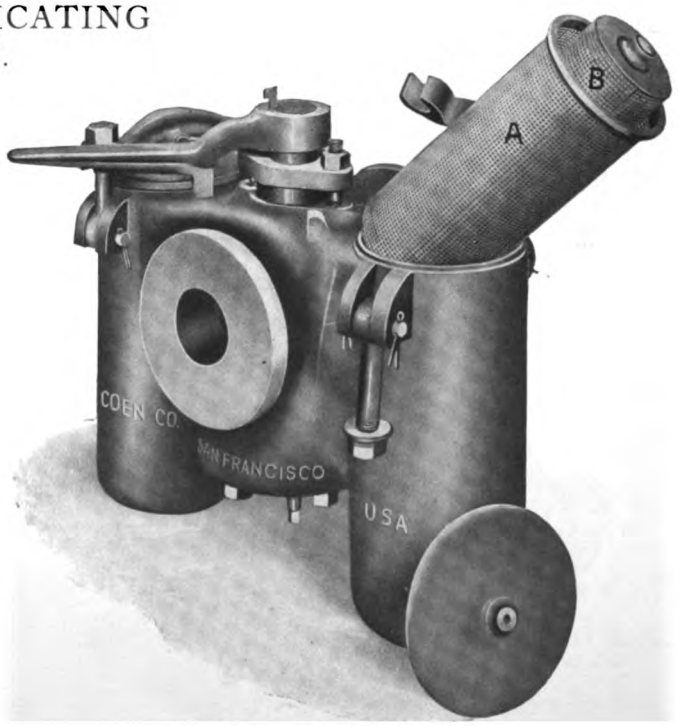

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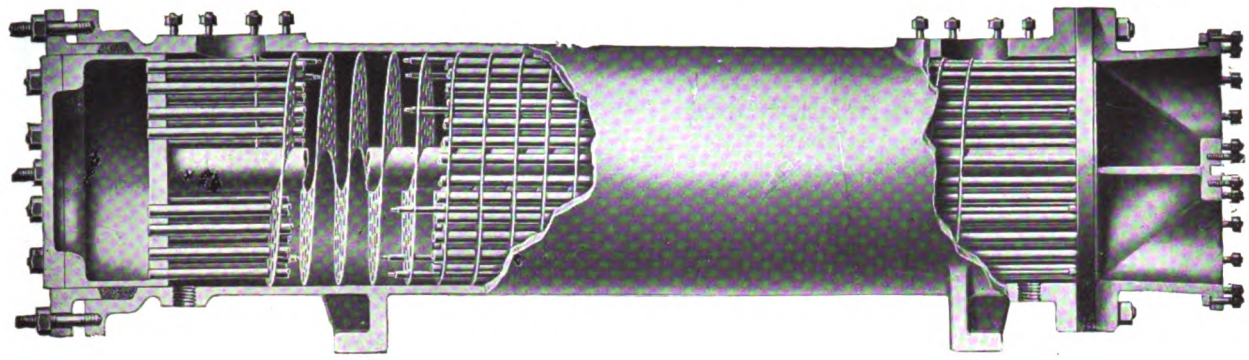

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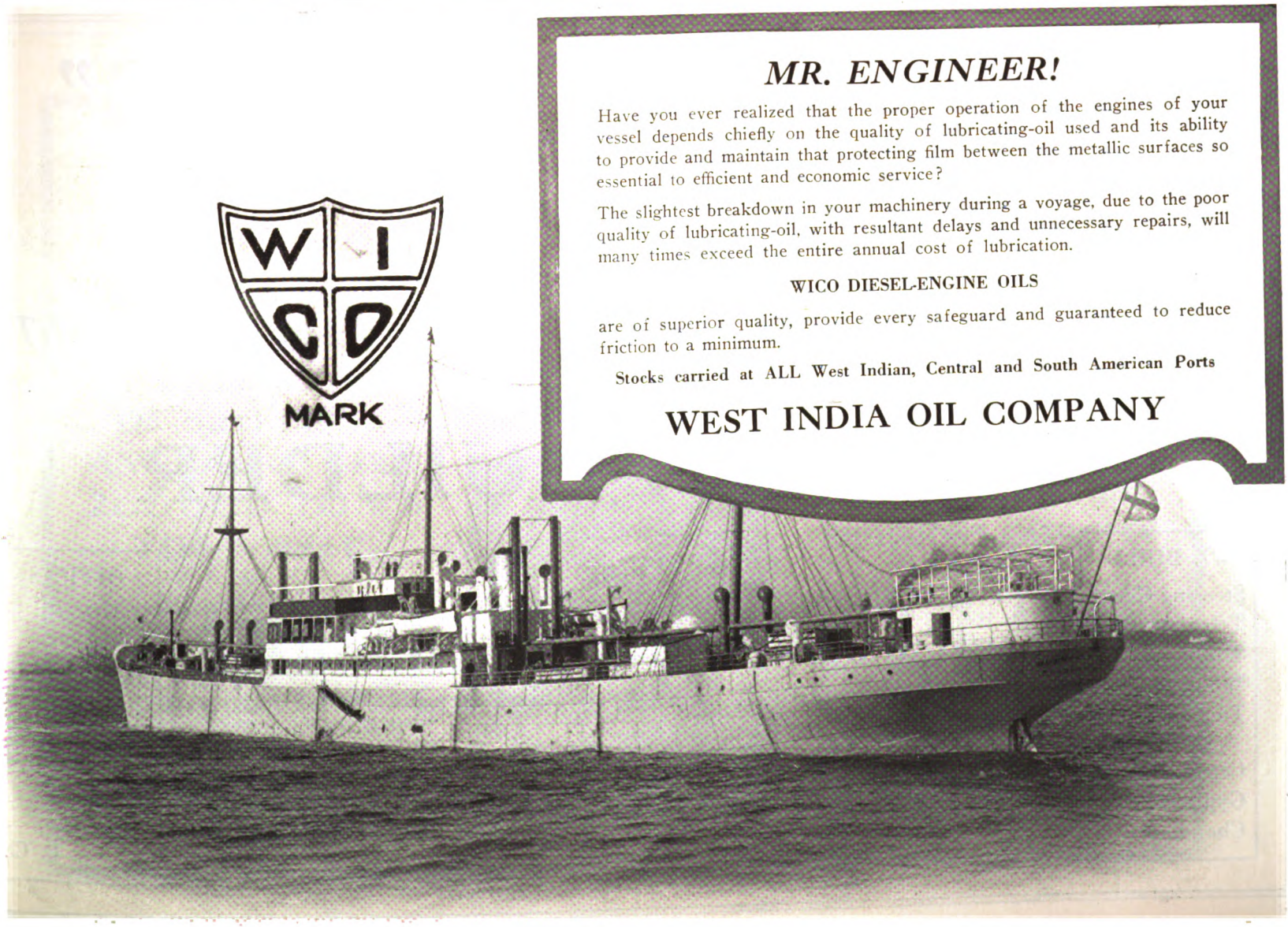

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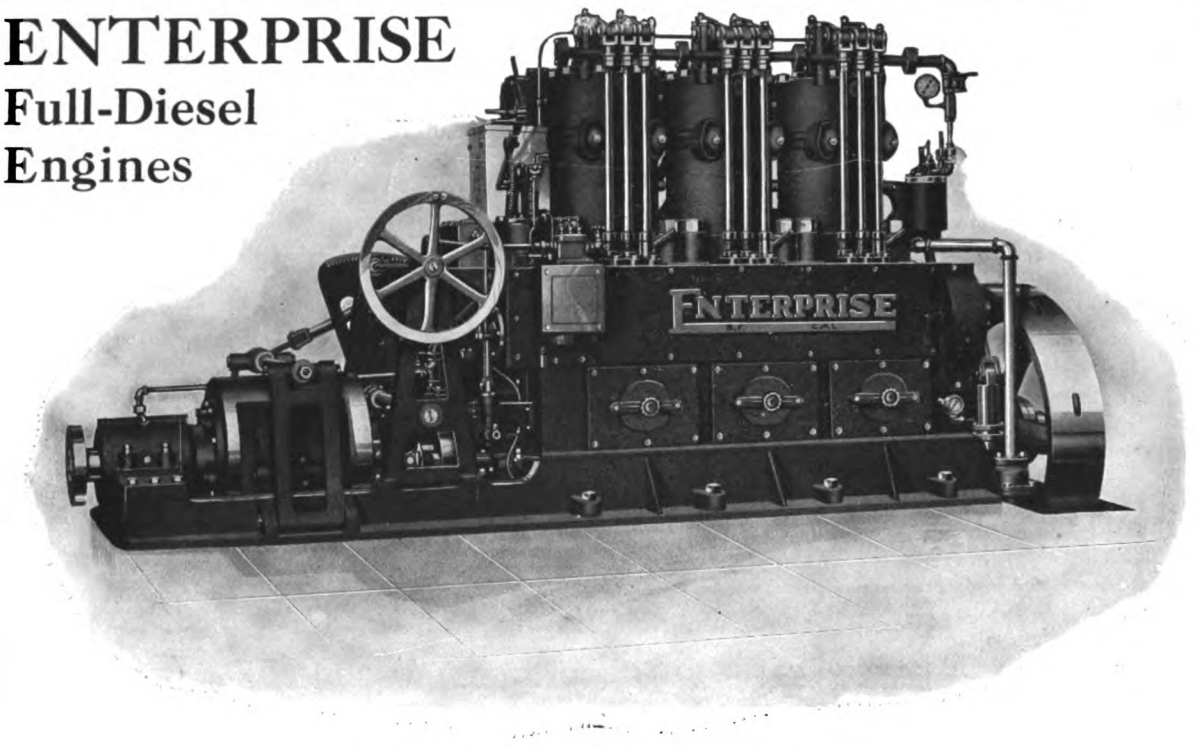

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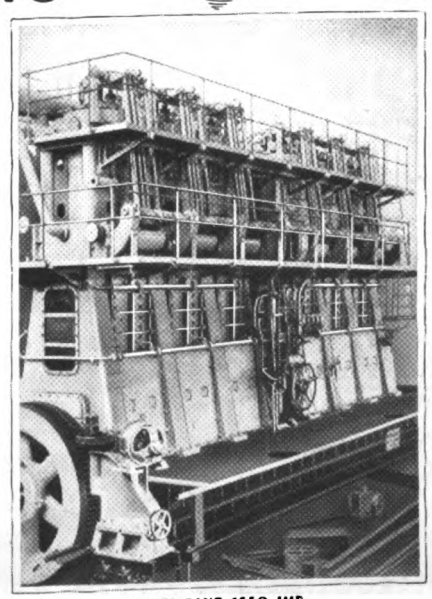

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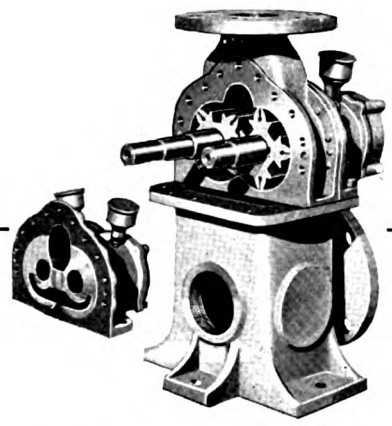

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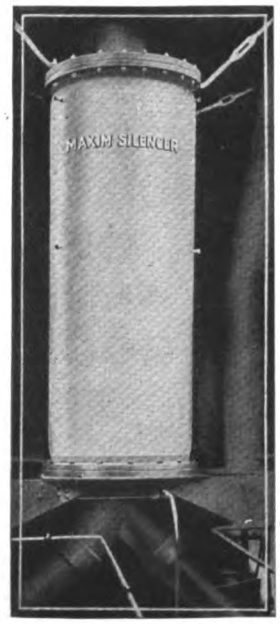

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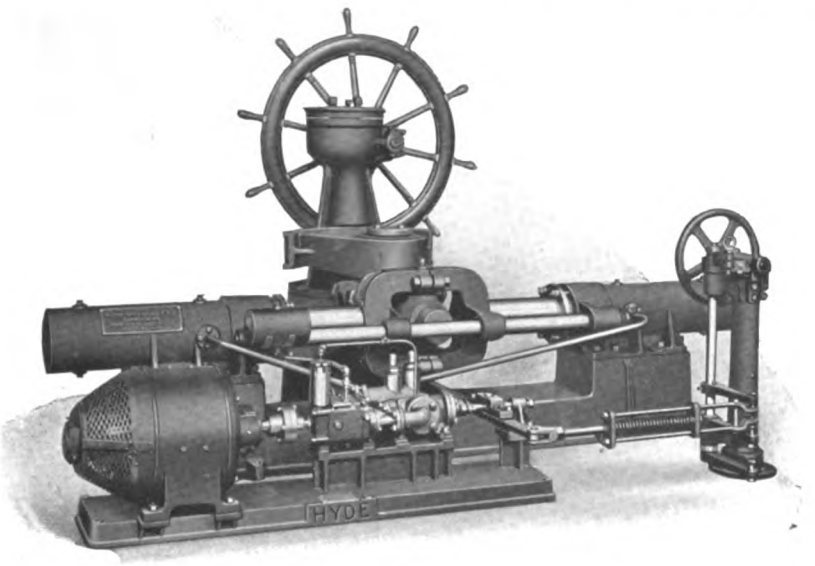

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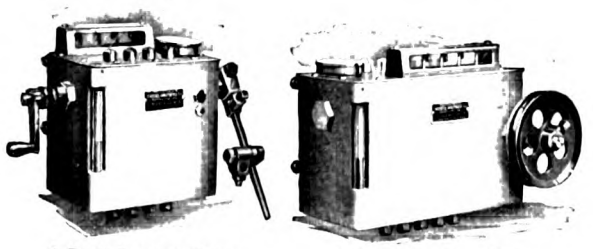

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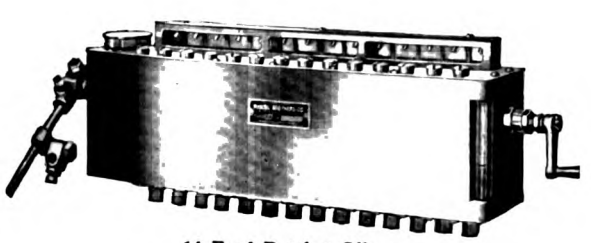

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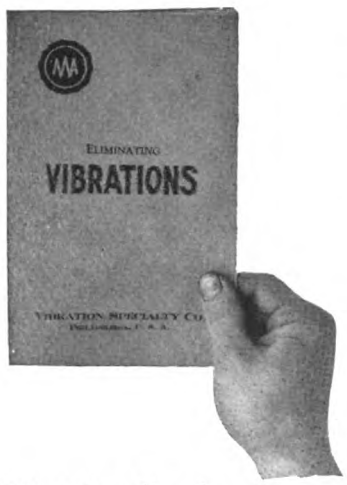

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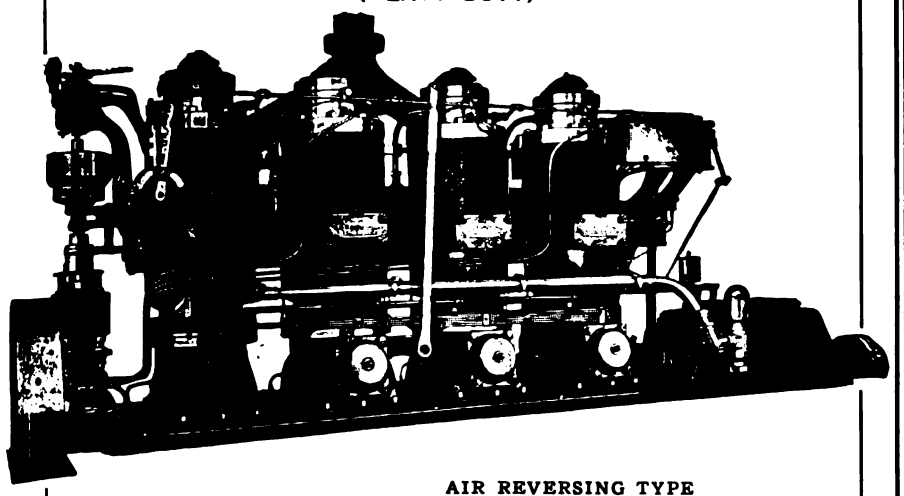

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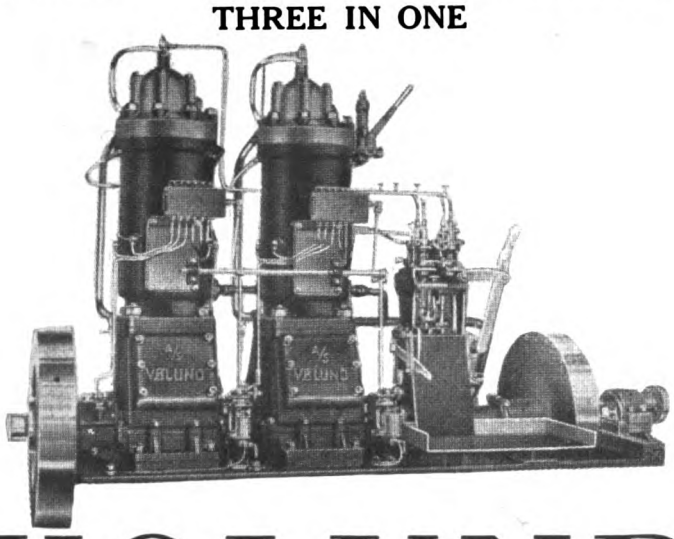

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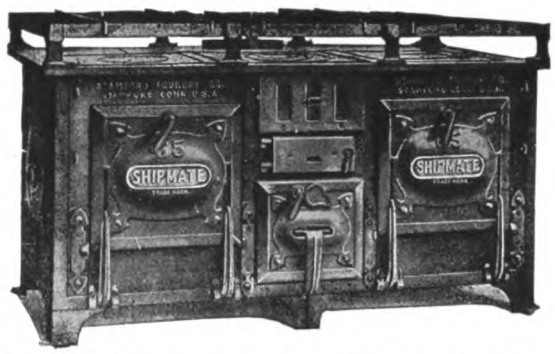

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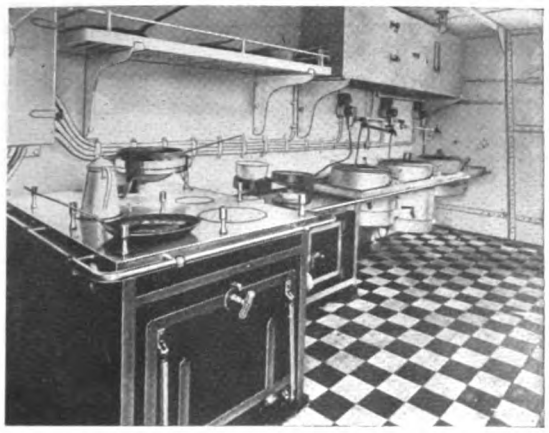

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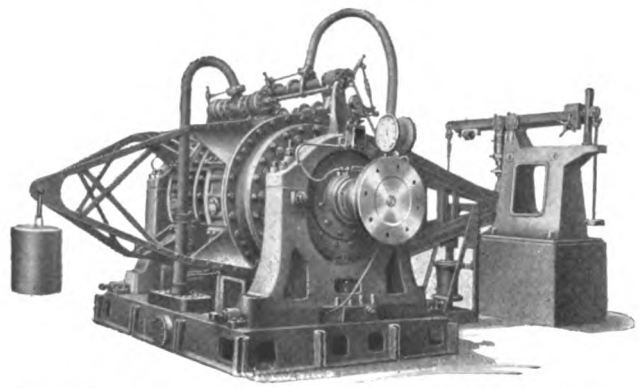

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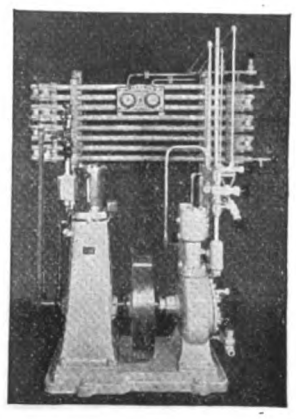

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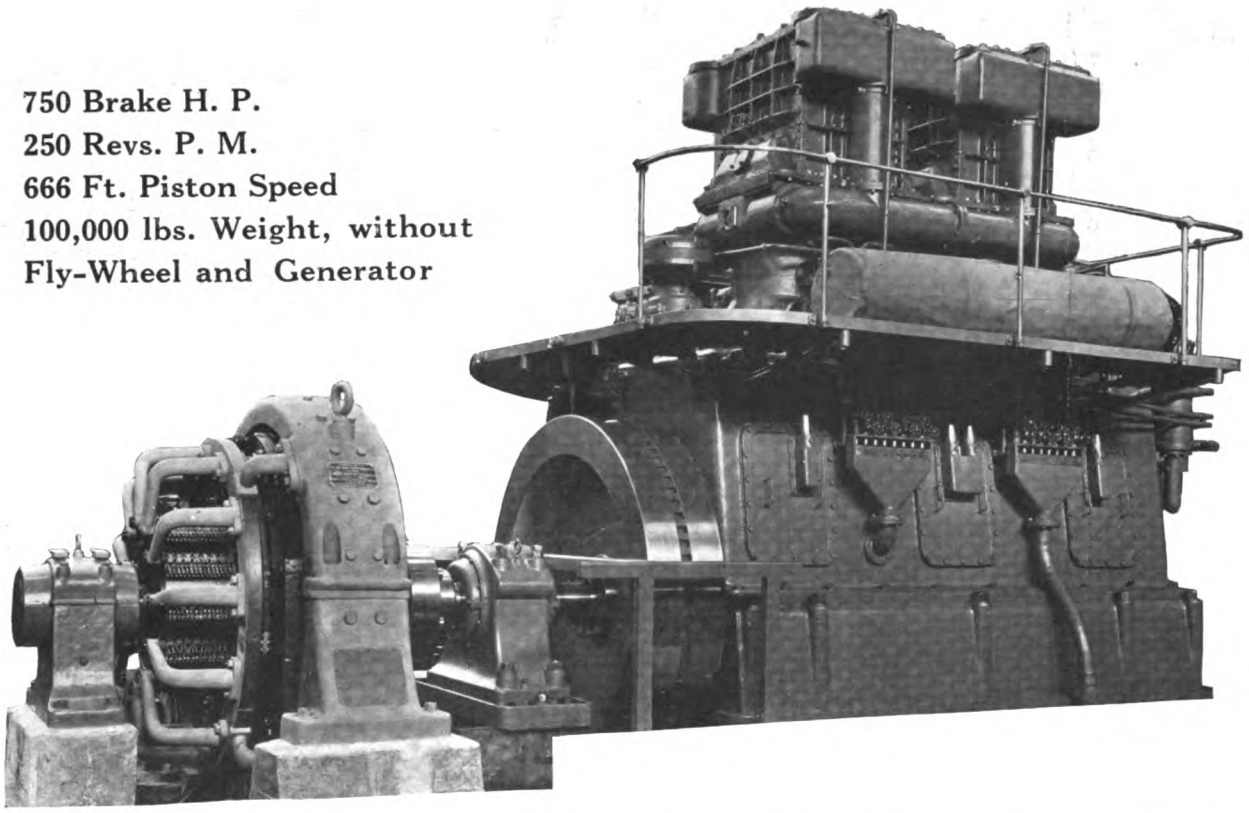

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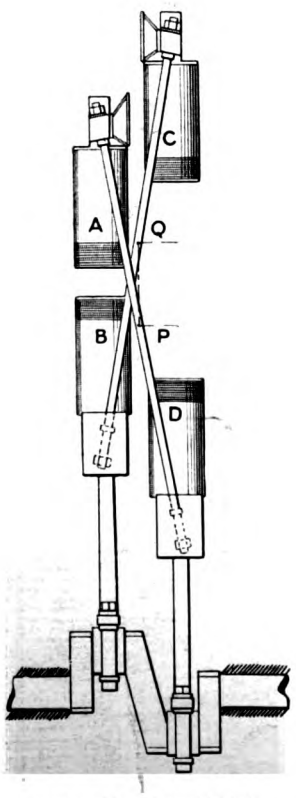

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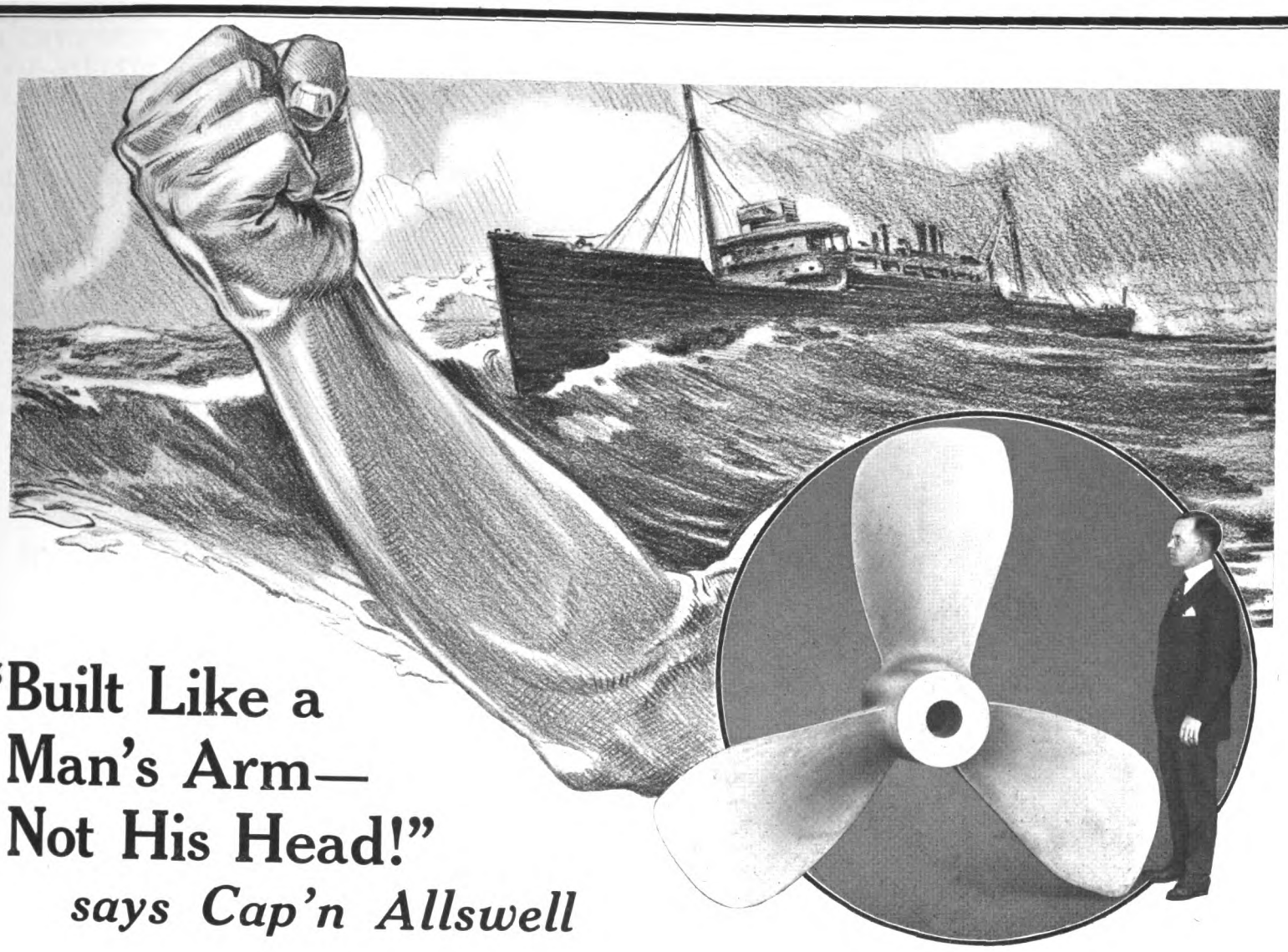

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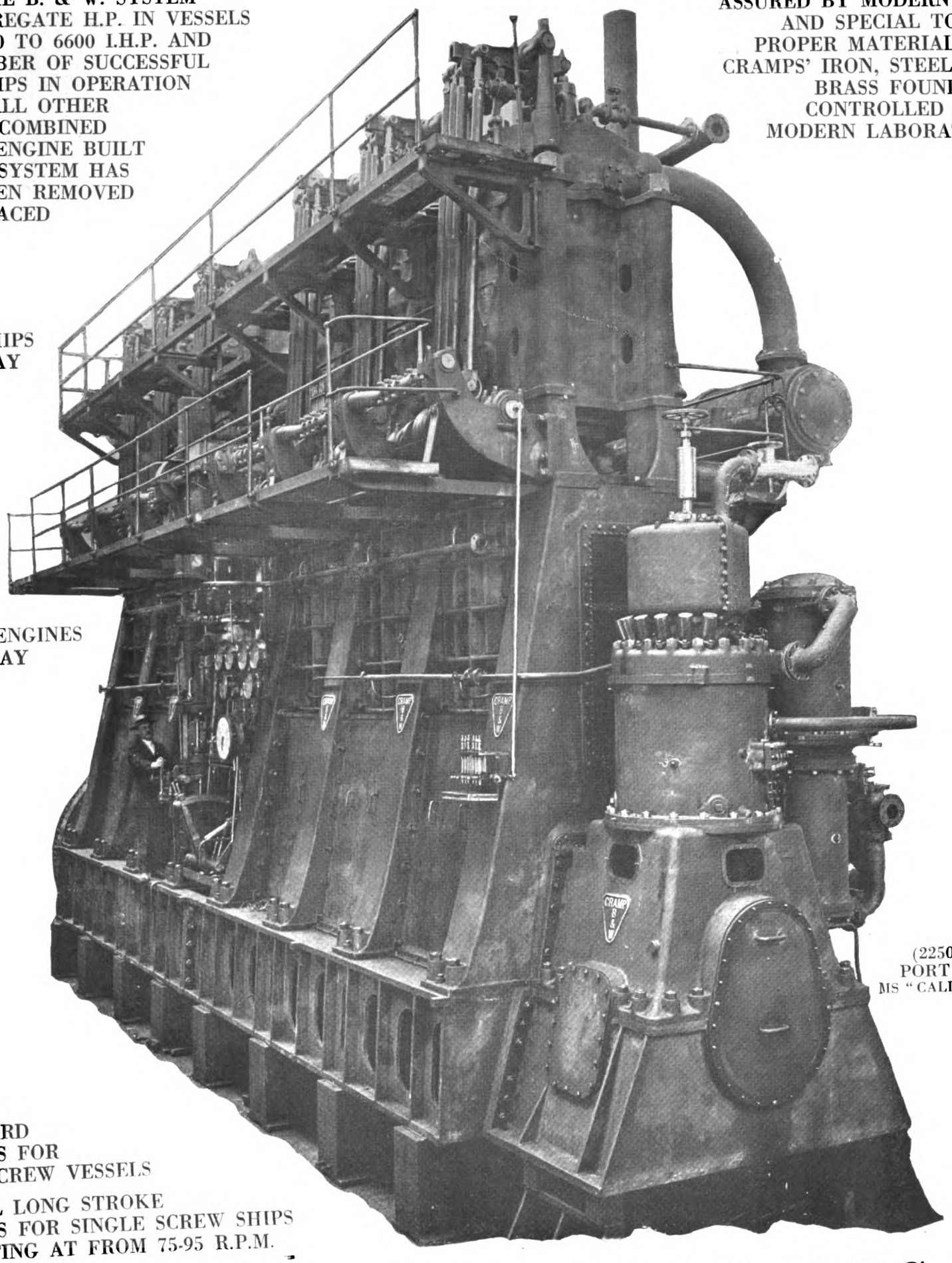

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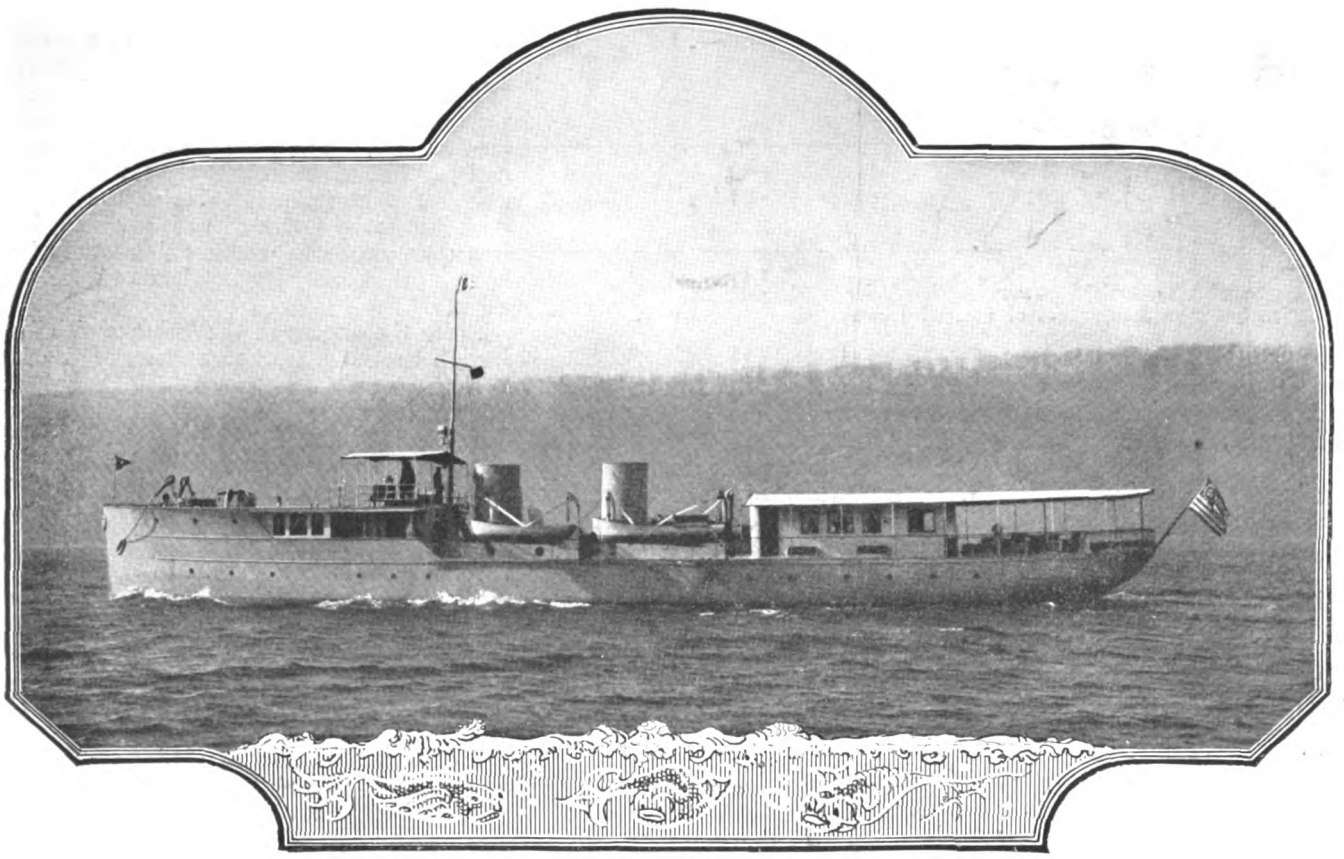
OIL DIESEL TYPE E



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"Sabalo," one of the finest examples of Off Shore Cruisers, is now equipt with a pair of Winton Diesel Oil Engines developing 300 H.P. a piece. She is 140′ x 19′ 6″ x 7′ and was built by Geo. Lawley & Son Corp. from designs by Tams & King, and is owned by Mr. Van Lear Black.

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"Sabalo," is but another example of the trend towards Winton Diesel Drive, either direct or electric, for the finer type of Off Shore Cruiser. Practically every new large yacht now under construction is to be Winton equipt.

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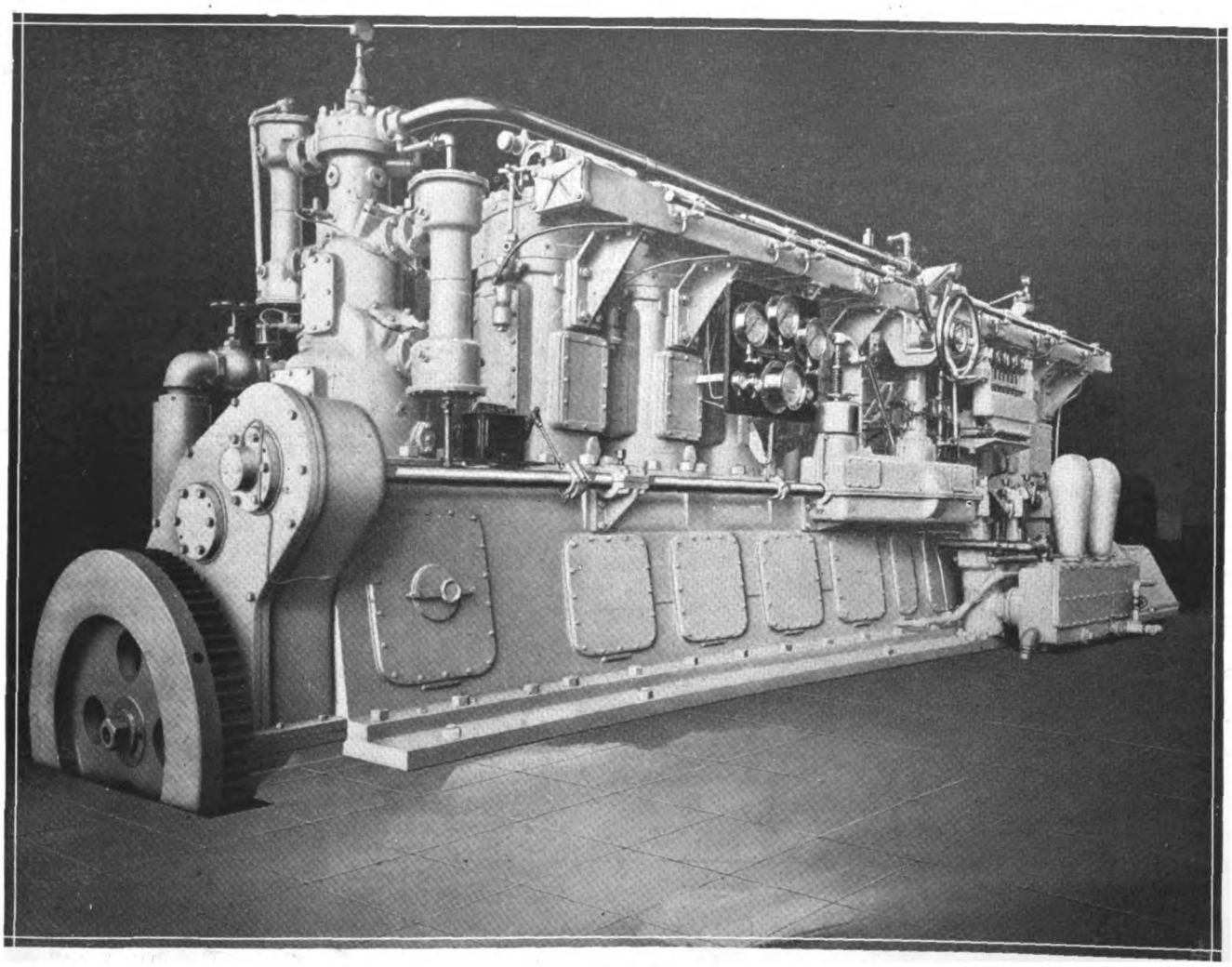

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M.S. "Jules Henry"

M.S. "Salerno"

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M.S. "Boelongan" M.S. "Bengkalis"

M.S. "Sebastian"

M.S. "Hermes" M.S. "Selene"

1910 to 1921

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Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
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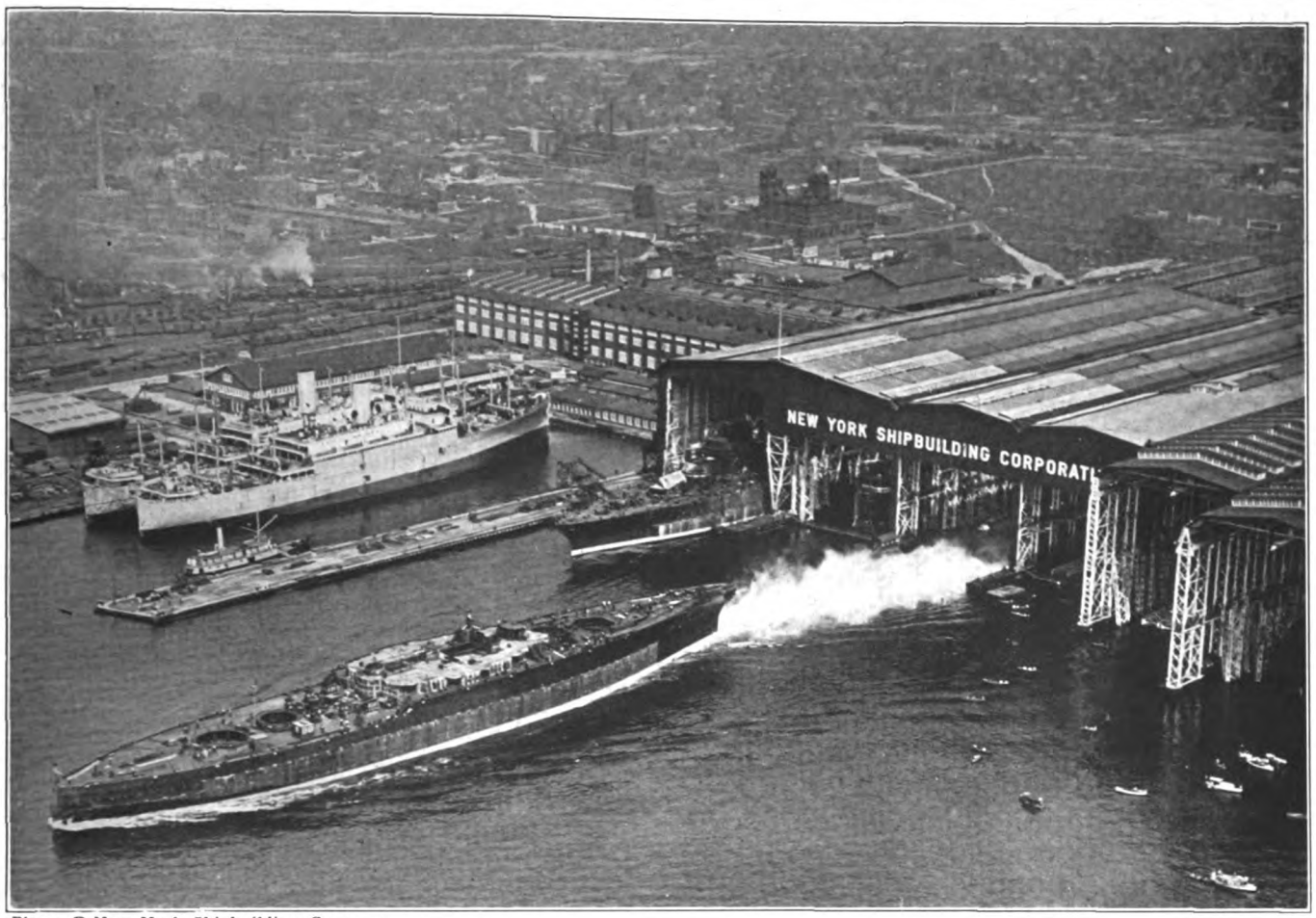

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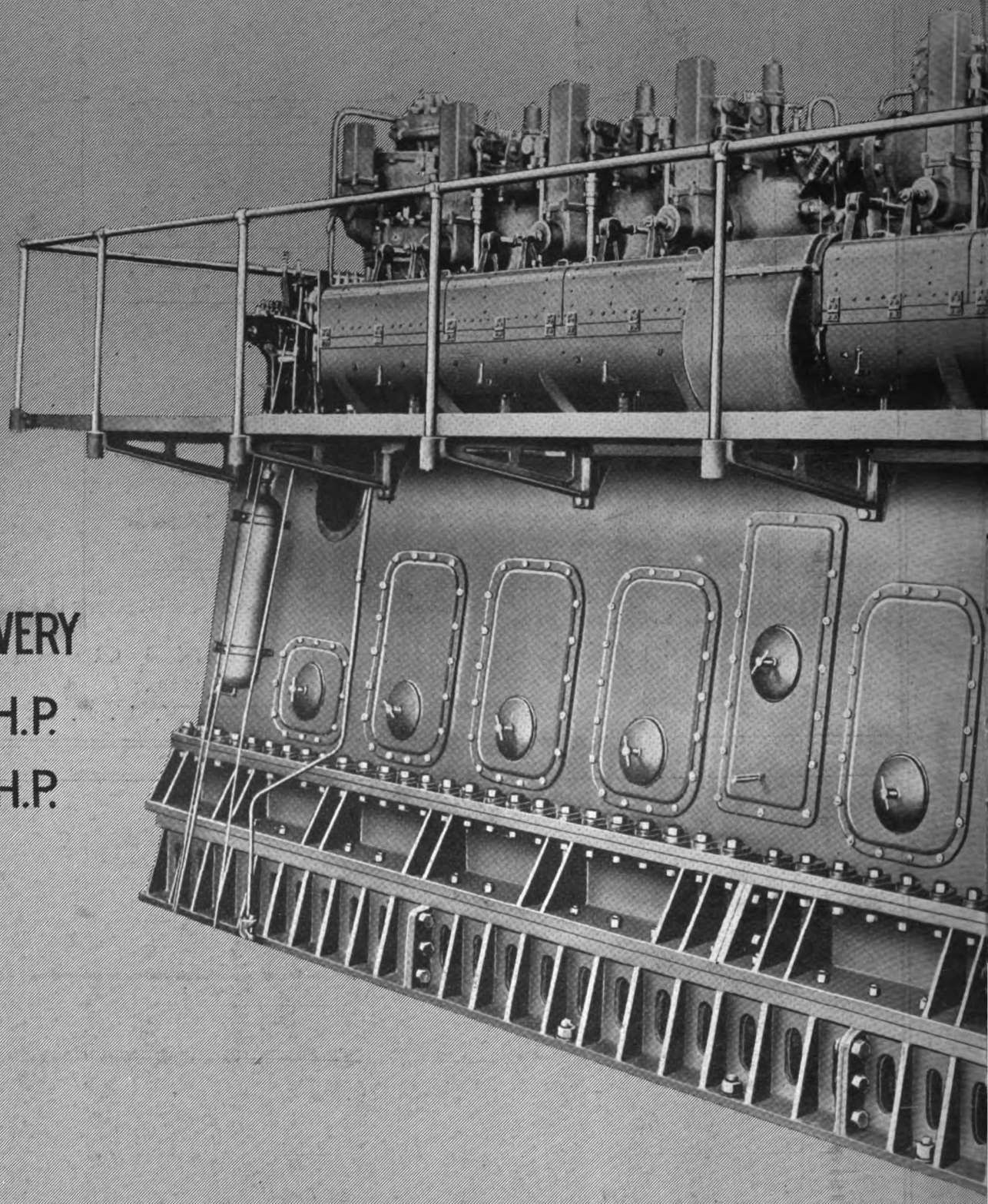

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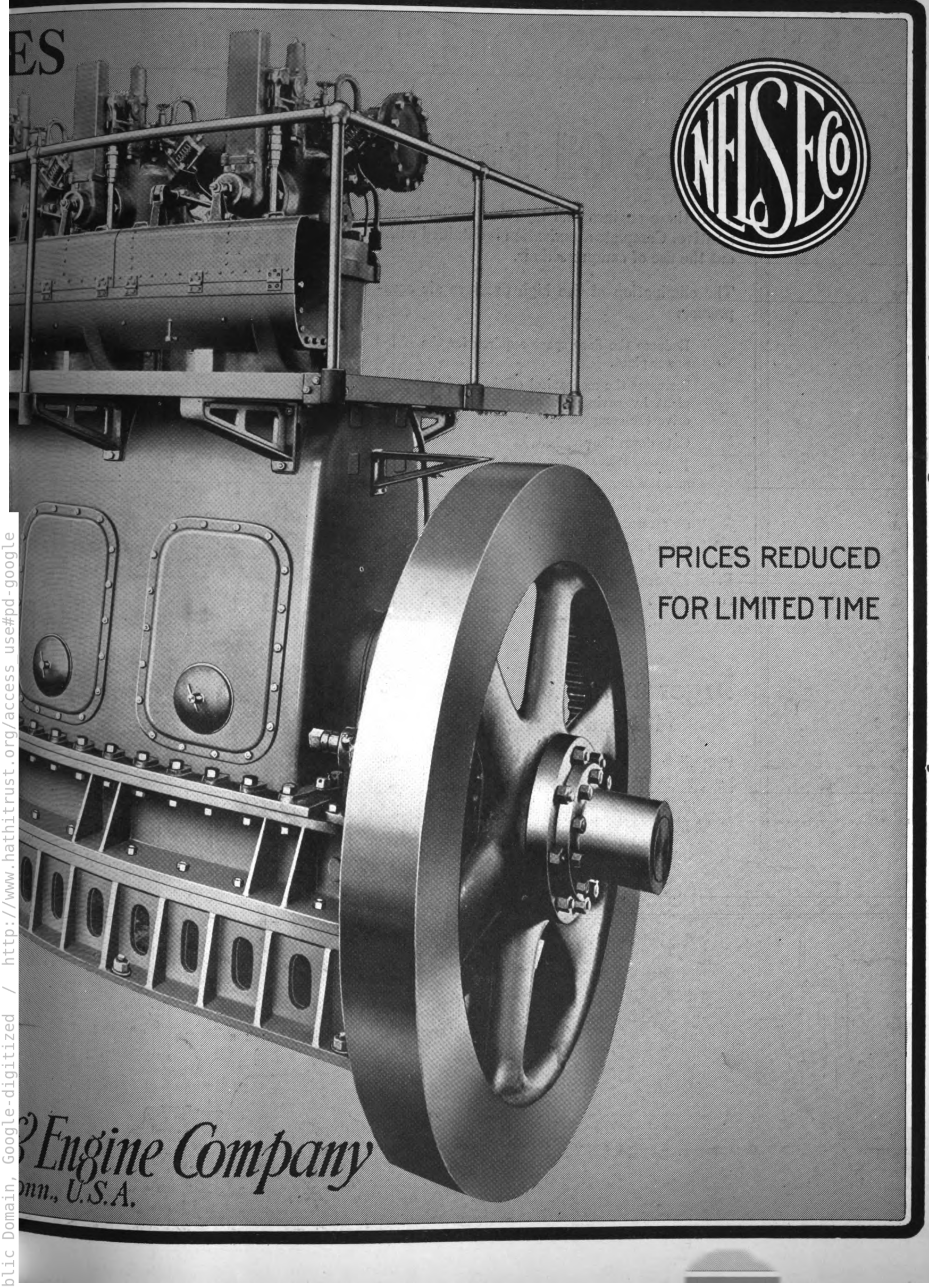

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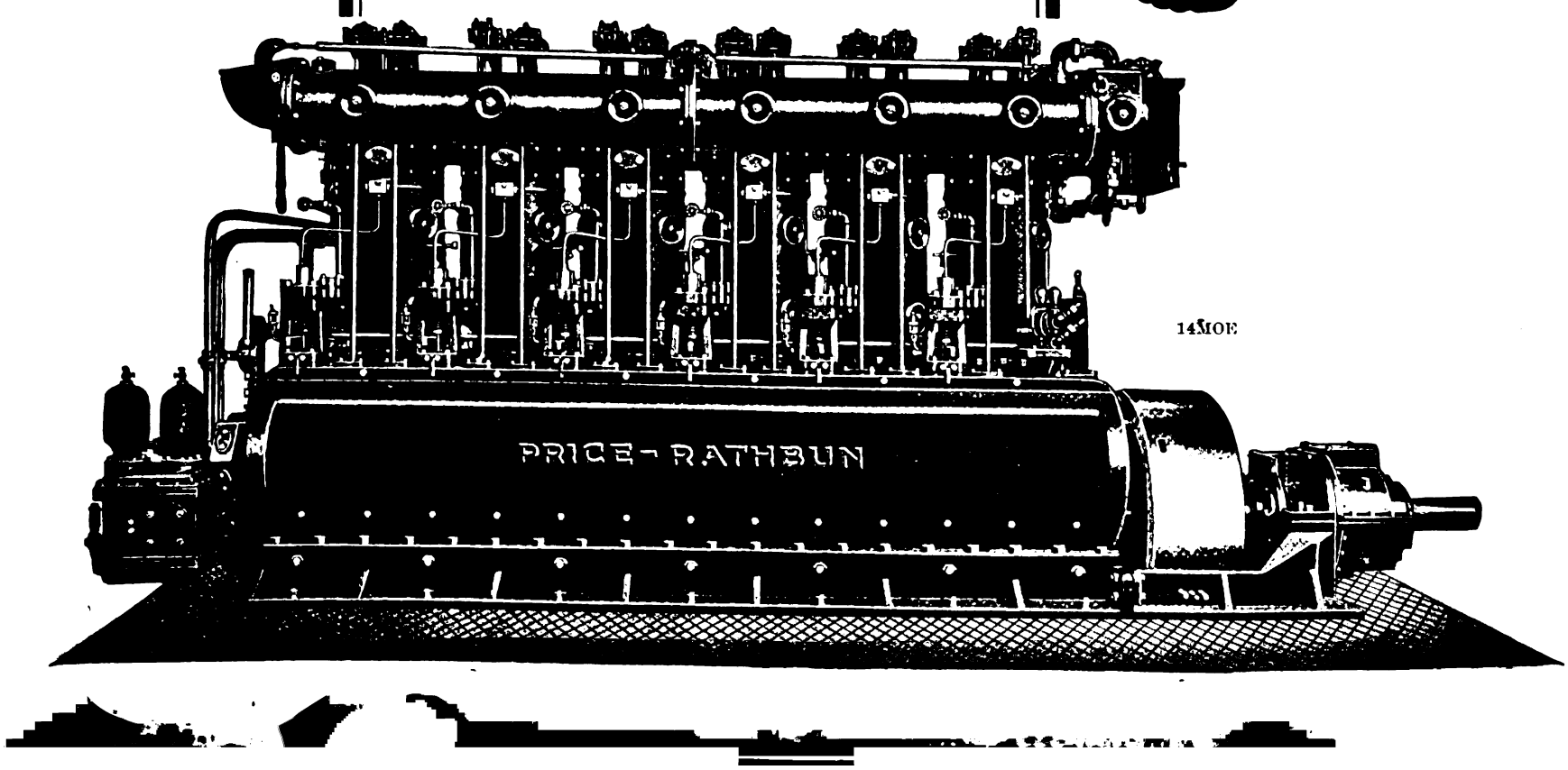

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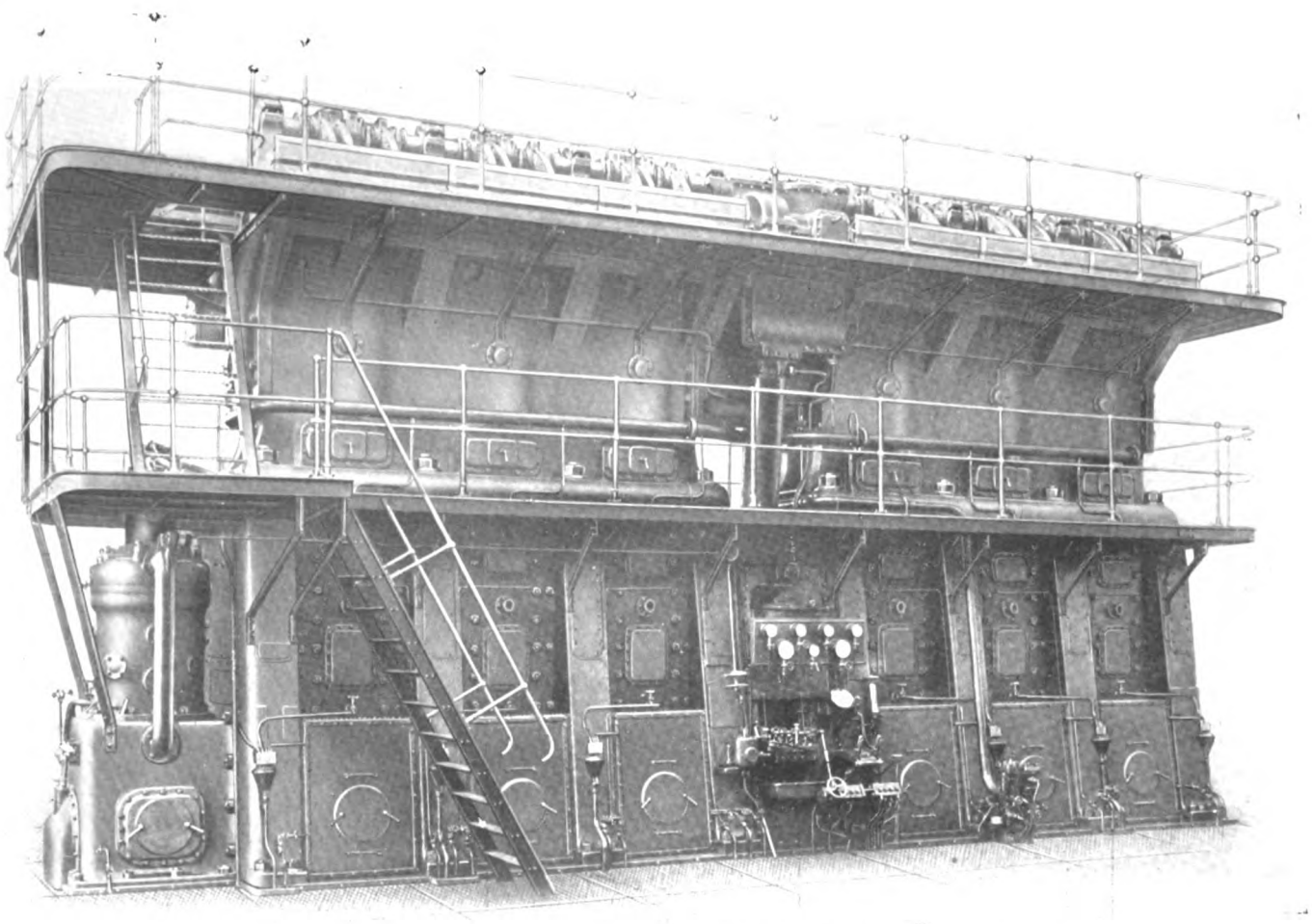

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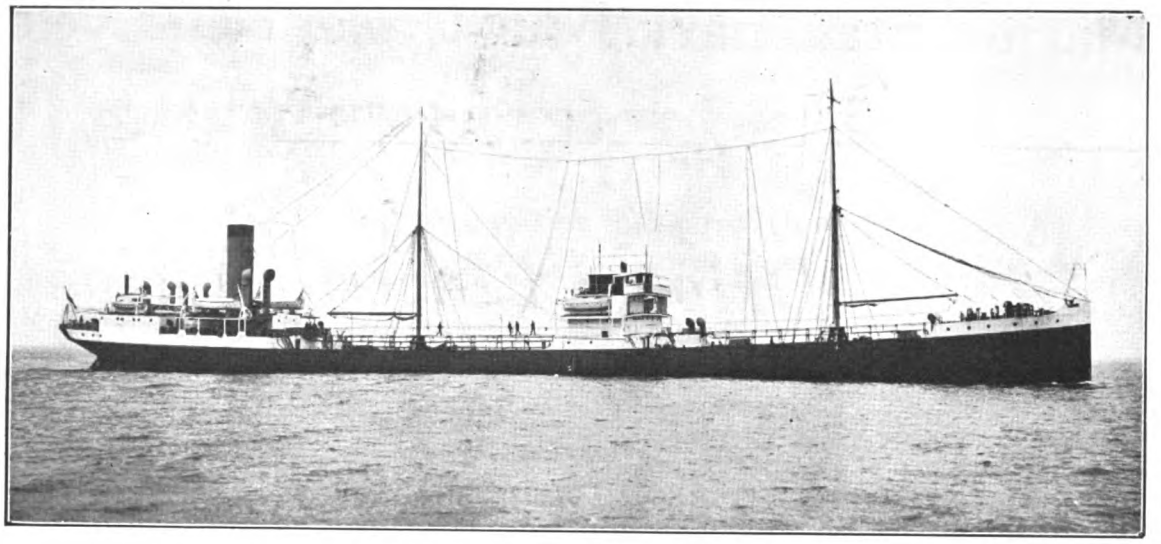

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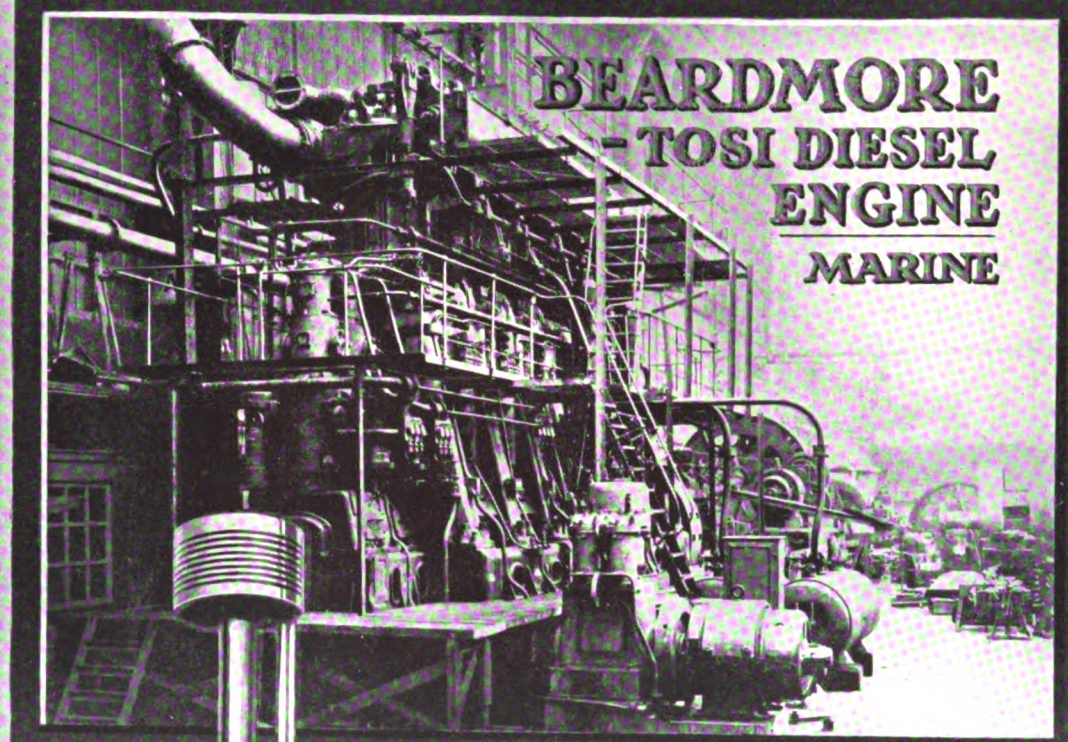
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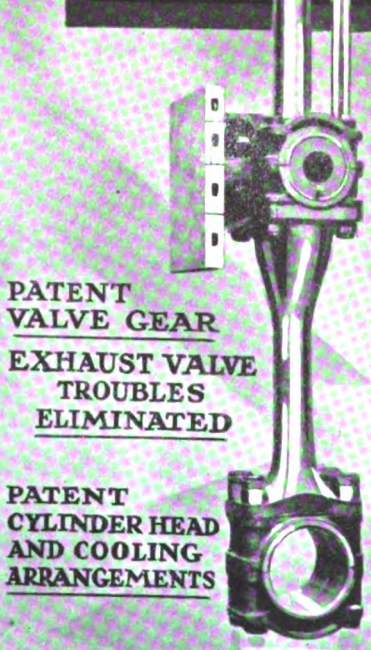
ENGINE
MARINE



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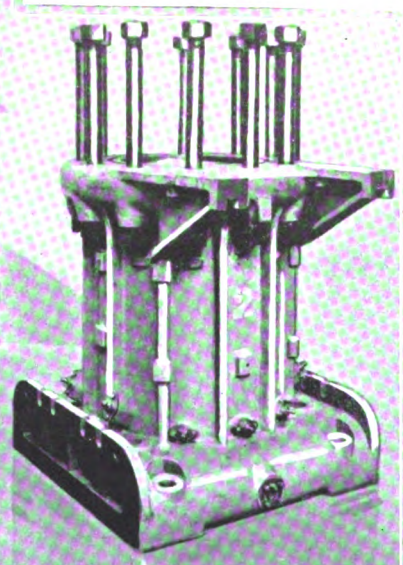

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Results of 100 Hours' Trial

Average B. H. P.	1,276
Mechanical efficiency, per cent	77
Average I. H. P.	1,646
Revolutions per minute	124
Mean pressure on B. H. P. basis, lb. per sq inch	75.5
Fuel consumption, lb. per P. H. P. per hour	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. F.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average	125
Piston cooling water, outlet temperature deg. Fah., average	130
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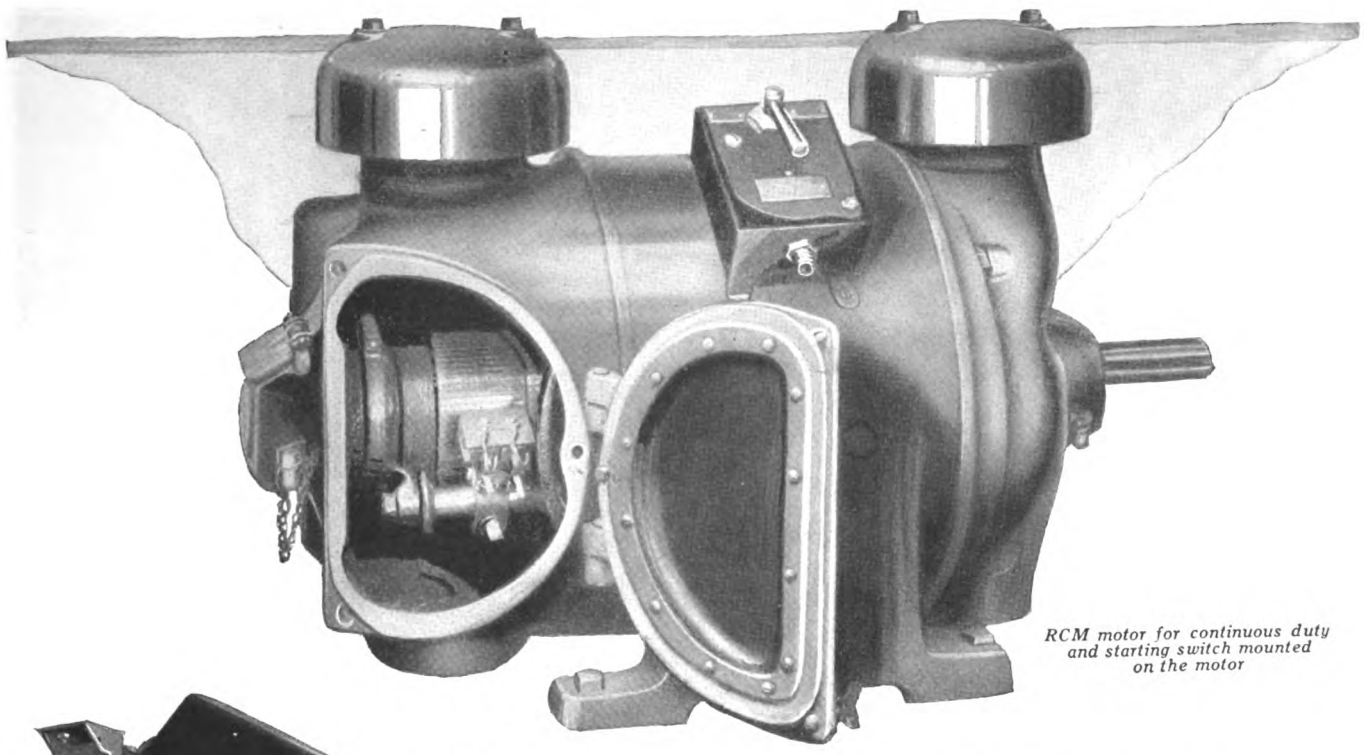
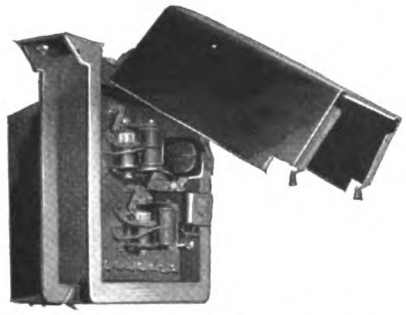


RCM motor for continuous duty and starting switch mounted on the motor



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You can depend on this motor

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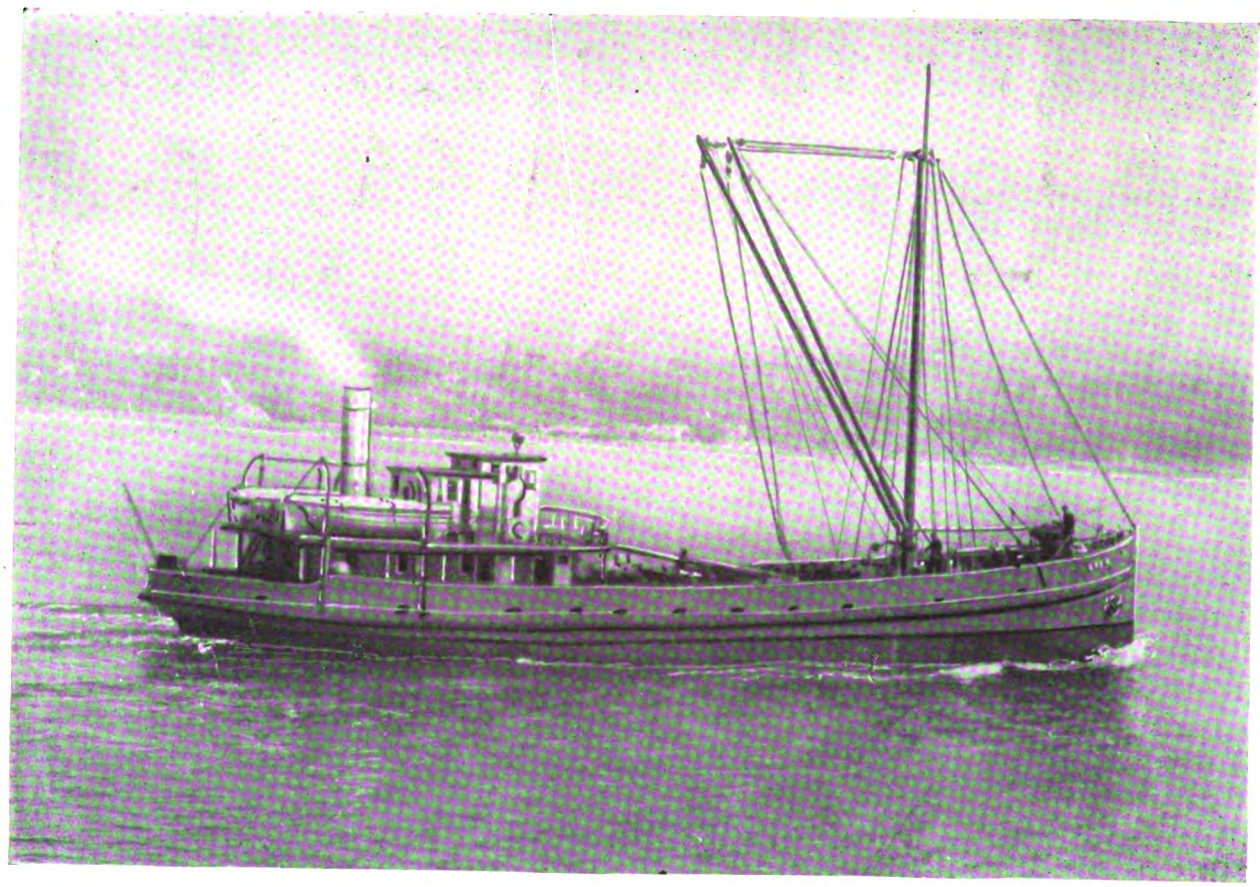

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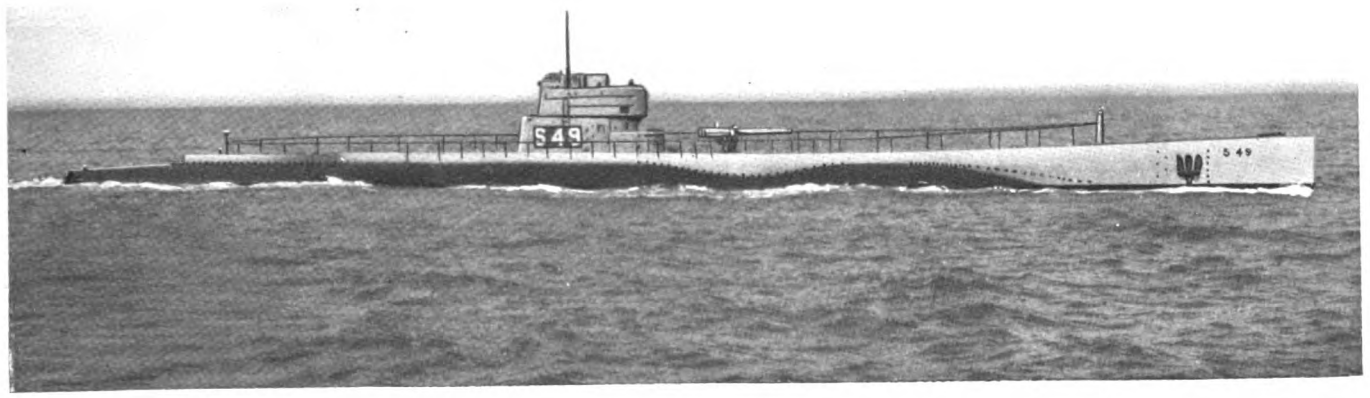

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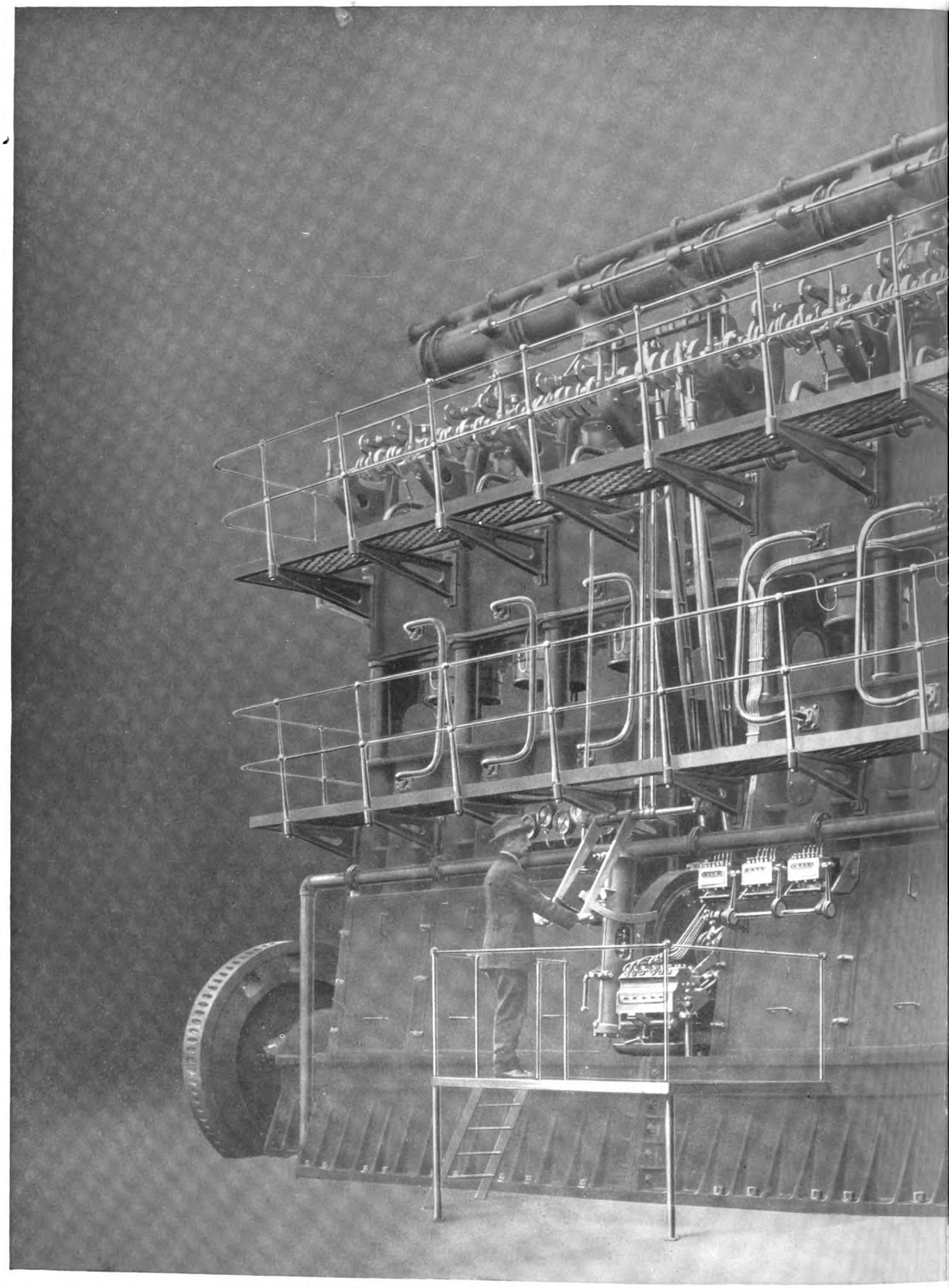

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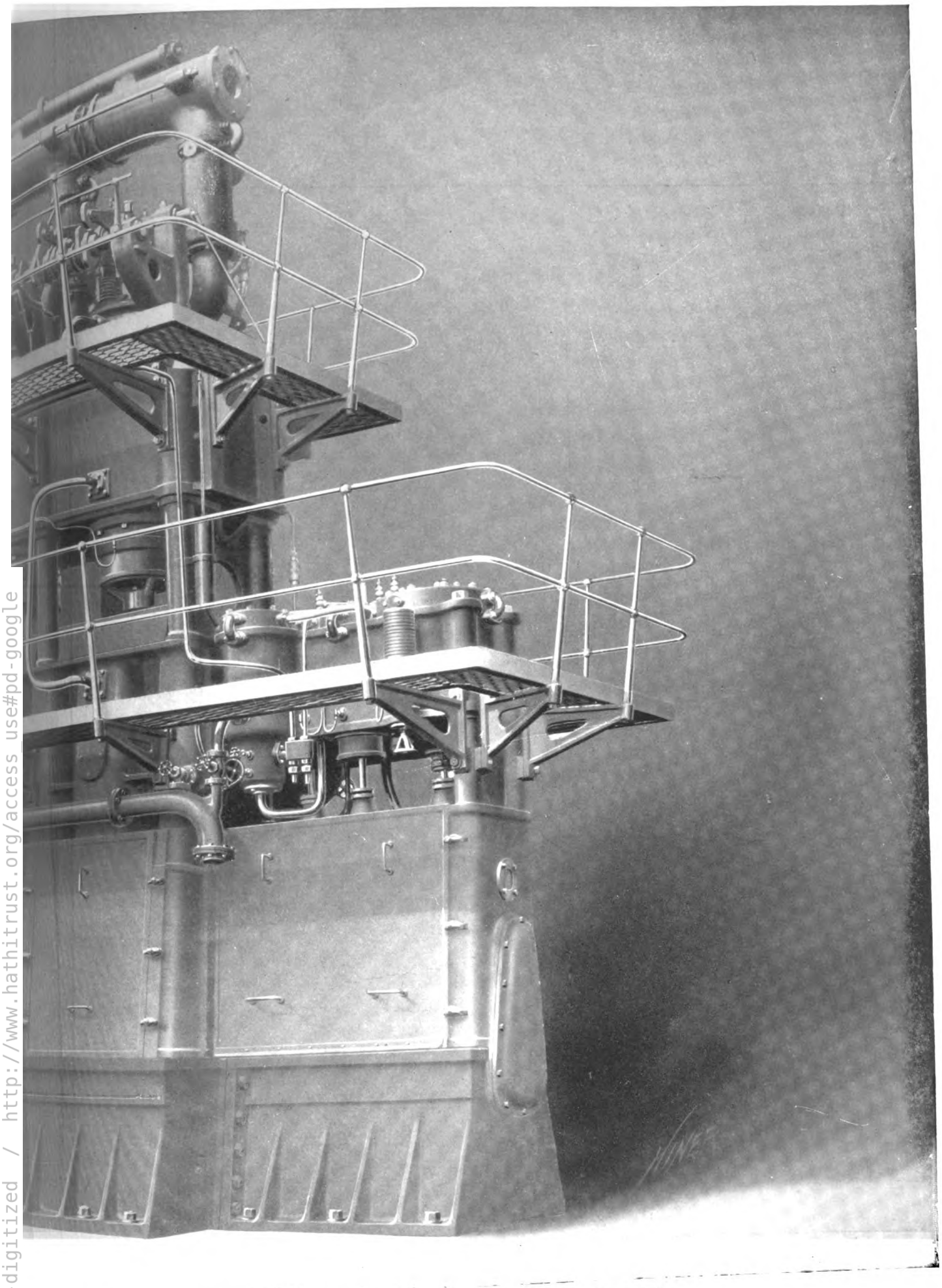

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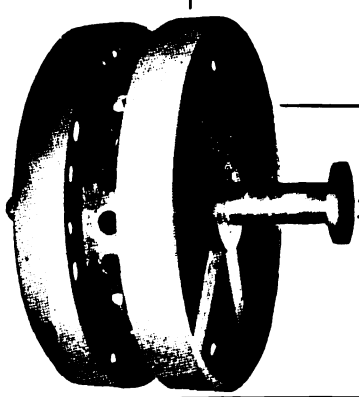

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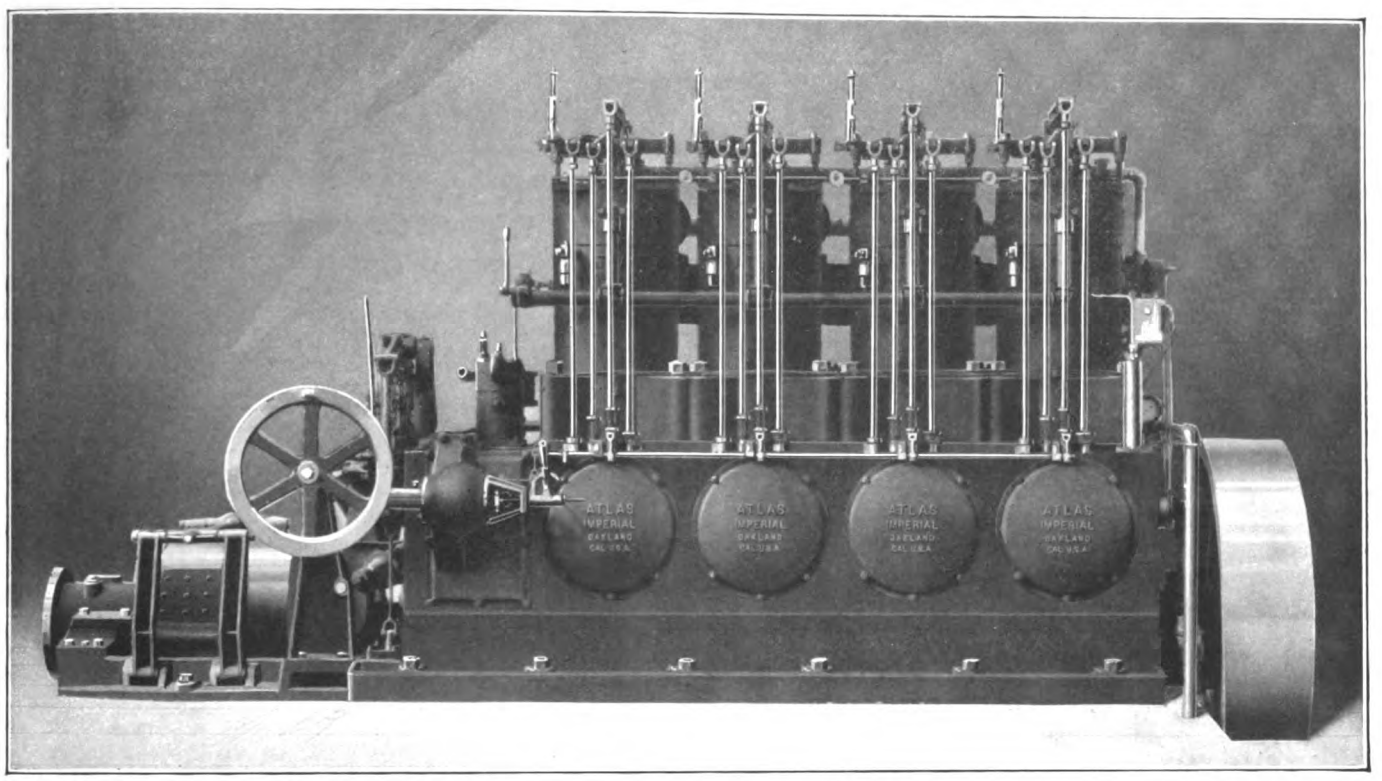

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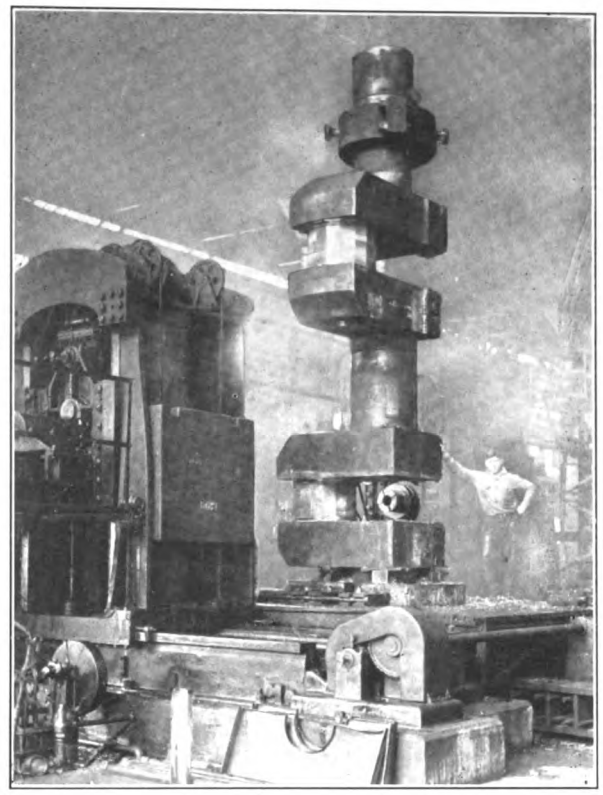

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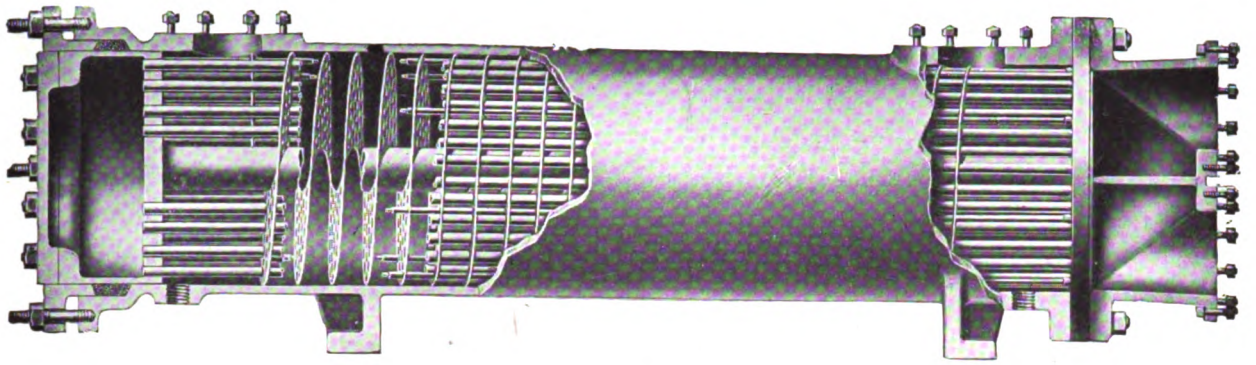

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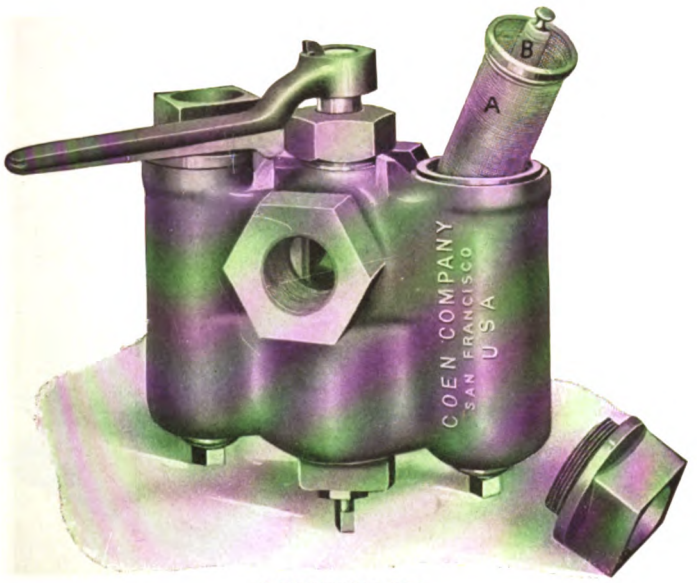

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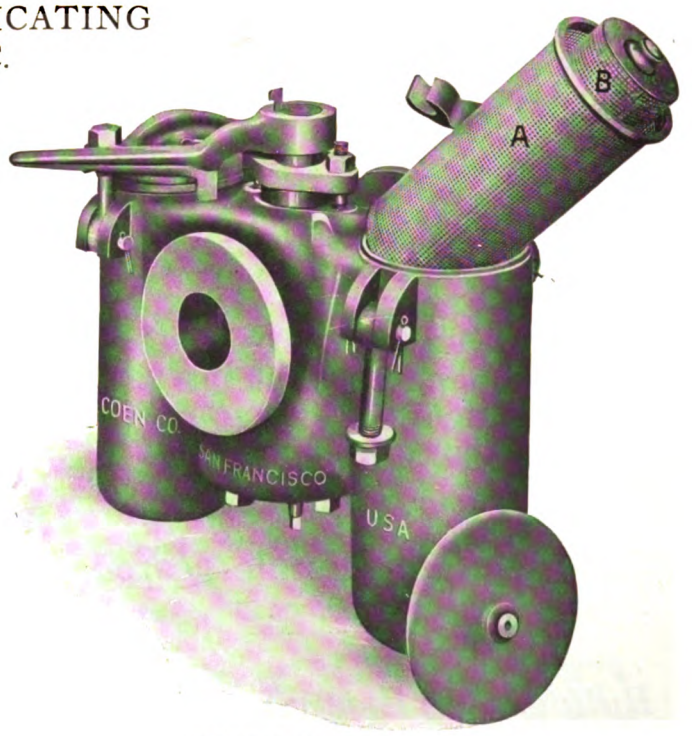

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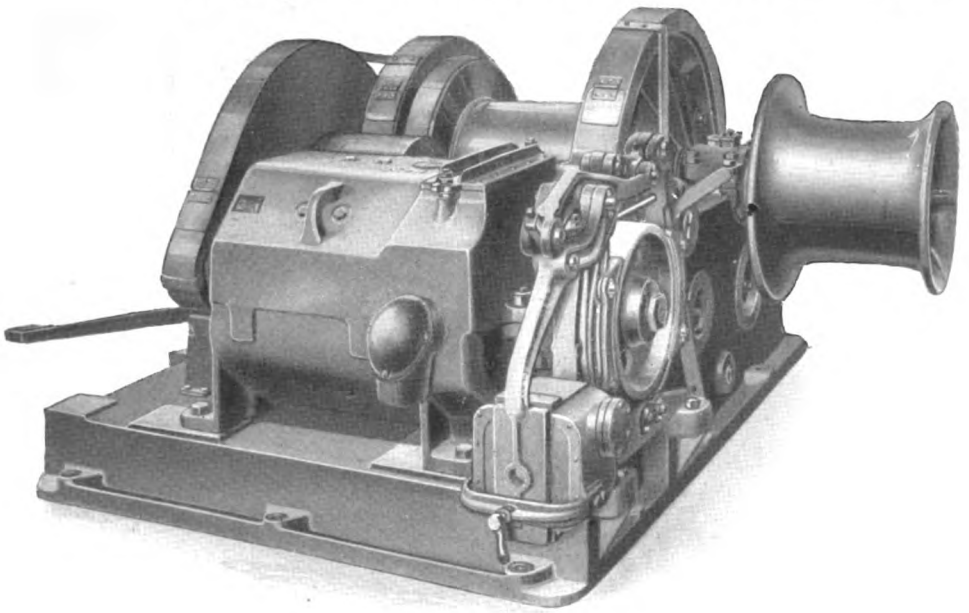

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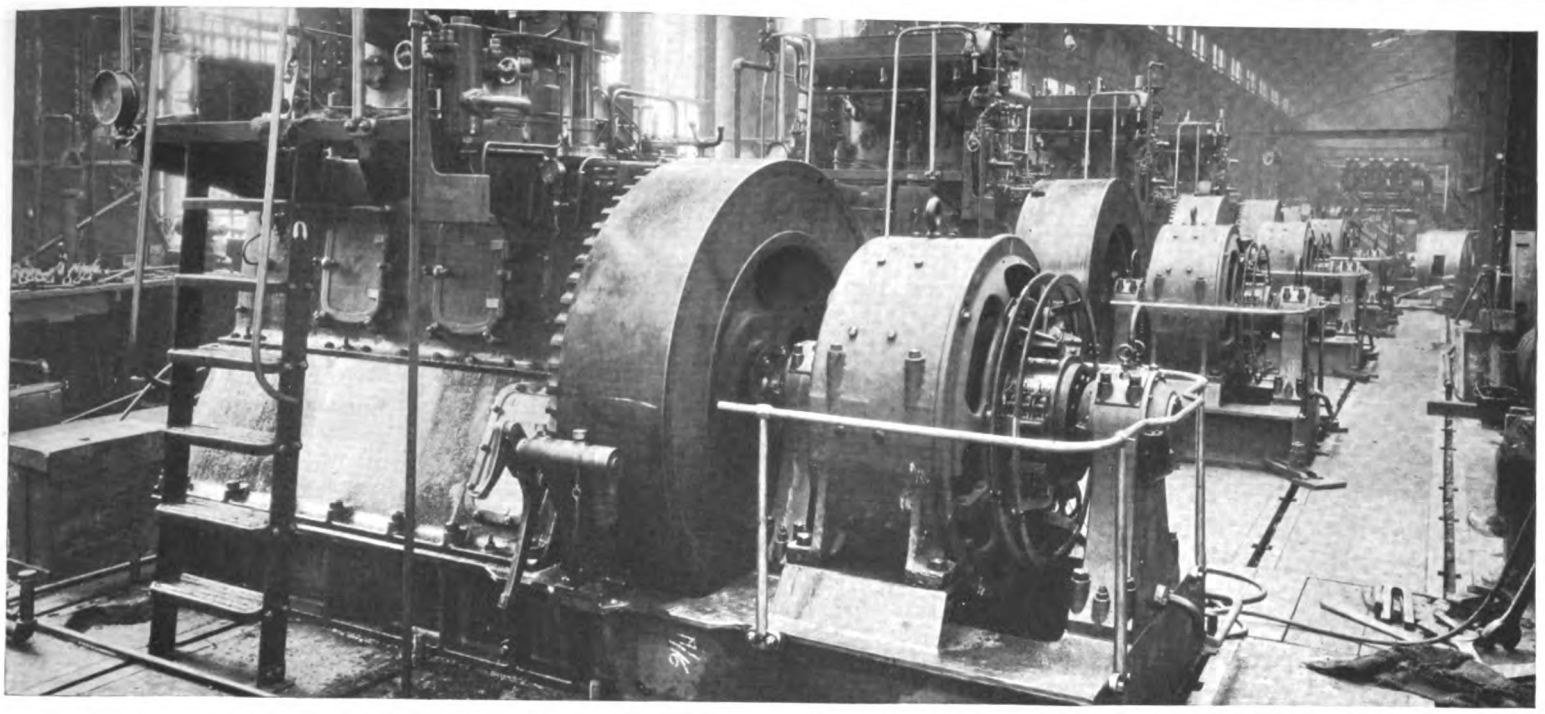

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The equipment pictured above represents the generating units for the American Hawaiian S.S. Co.'s new Motorships. Each set consists of a Cramp B. & W. Engine coupled to a Diehl Electric Generator of the open Heavy-Duty Type. Diehl Generators are arranged for forced-feed lubrication.

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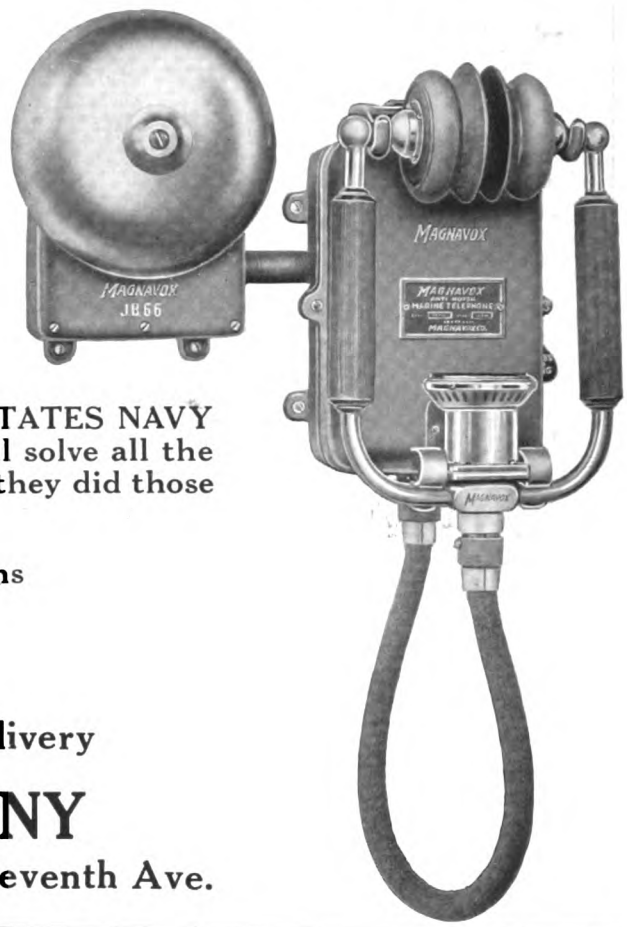

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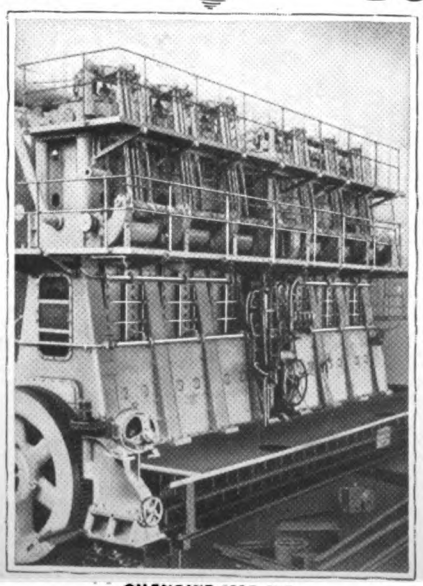

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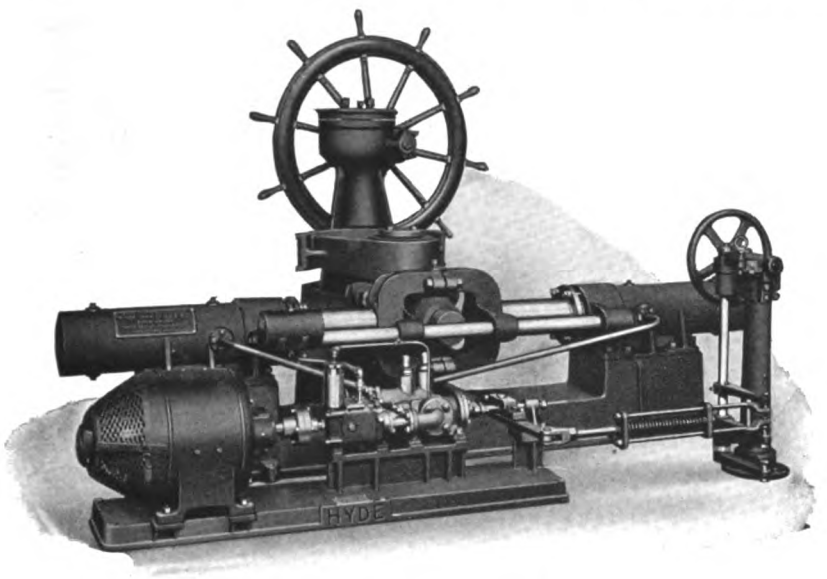

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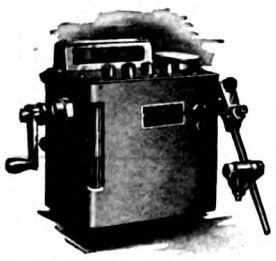

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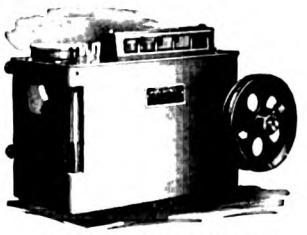

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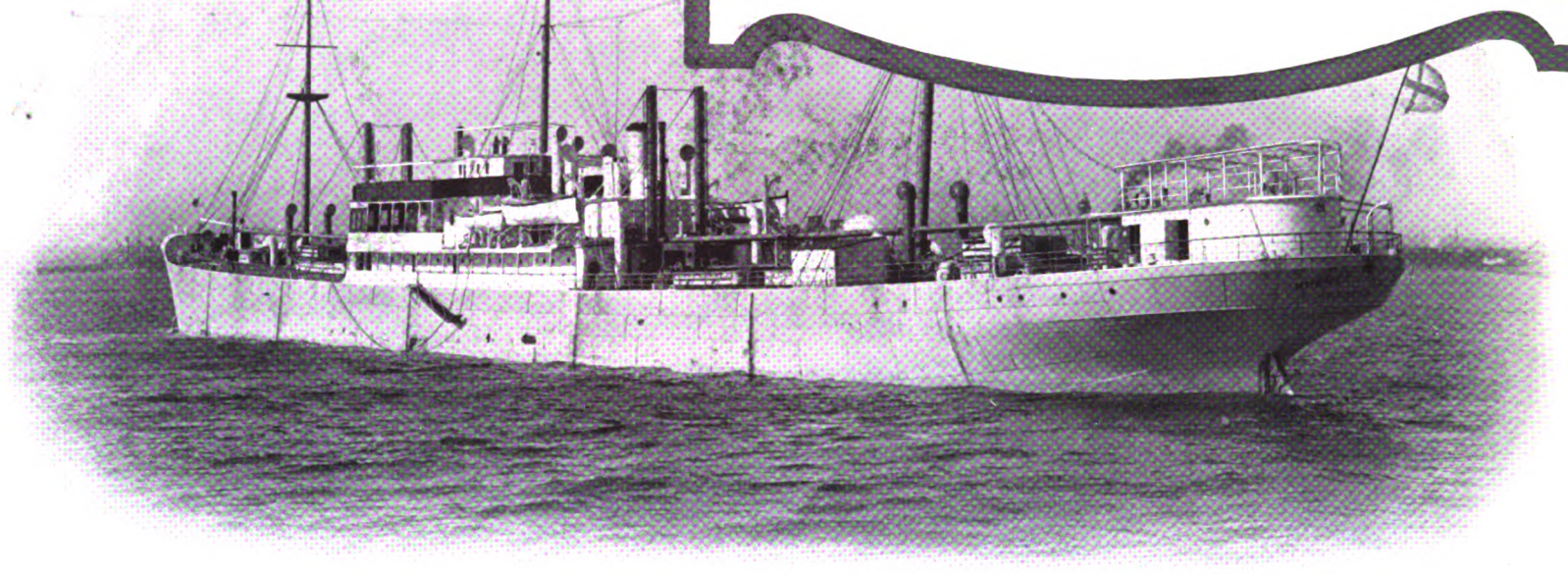

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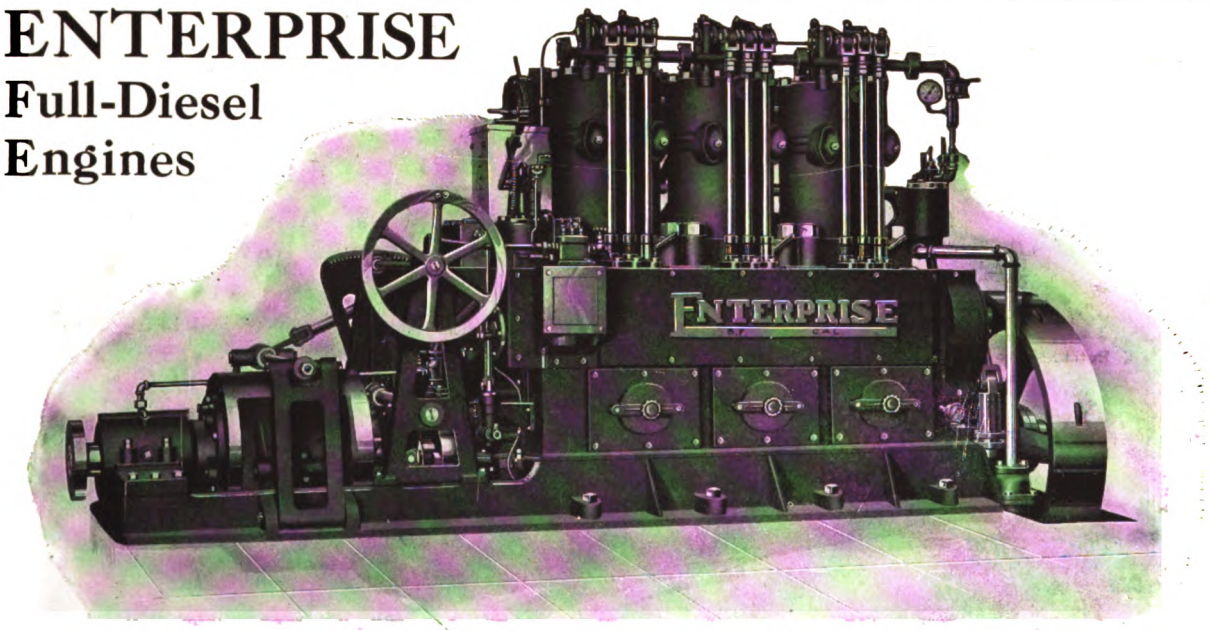

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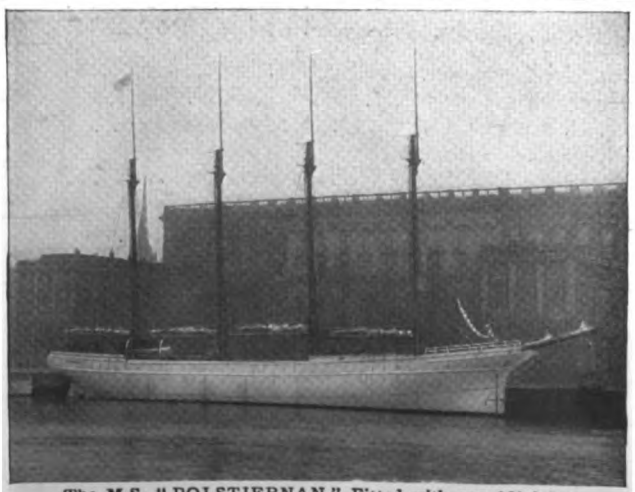

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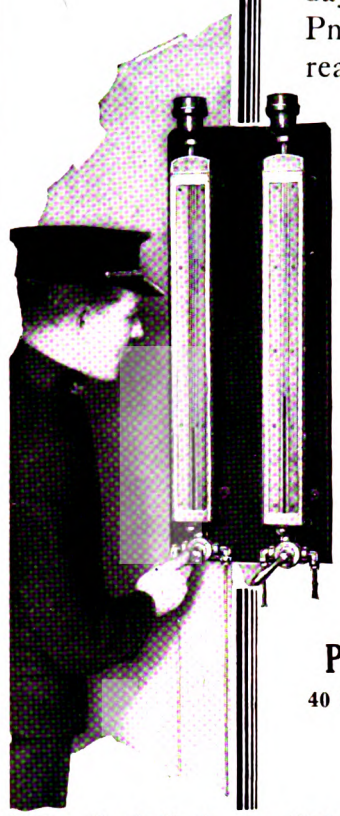

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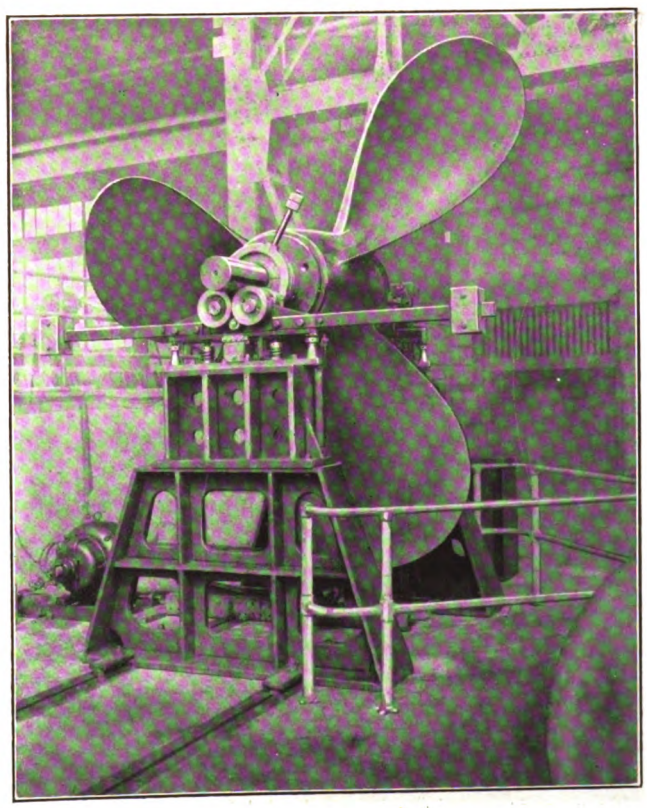

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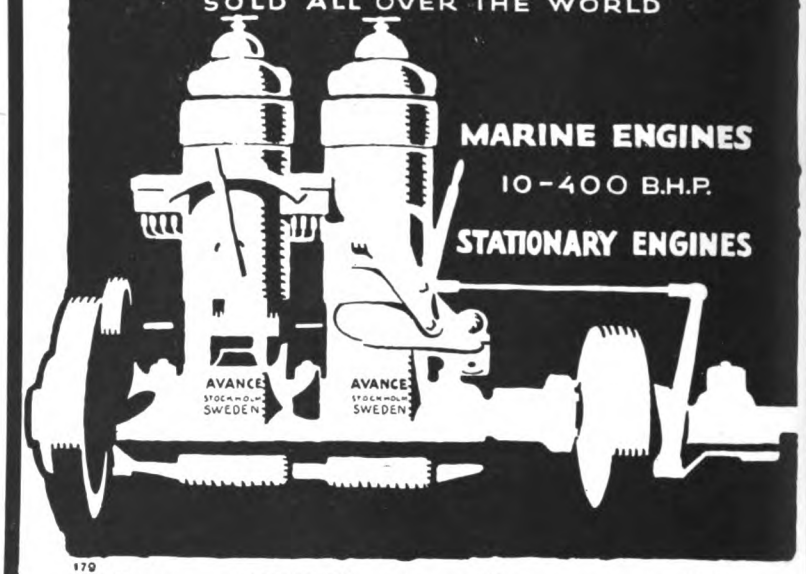

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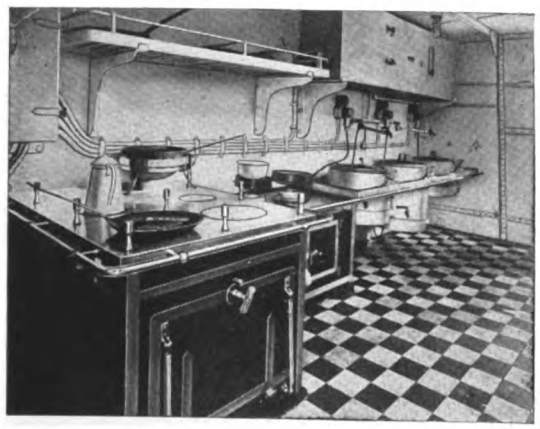

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VESTA Ltd.

GL. KONGEVEJ 15, COPENHAGEN, DENMARK

Our system is most durable, practical and economical. Cost of current and any required spare parts, only amounts to

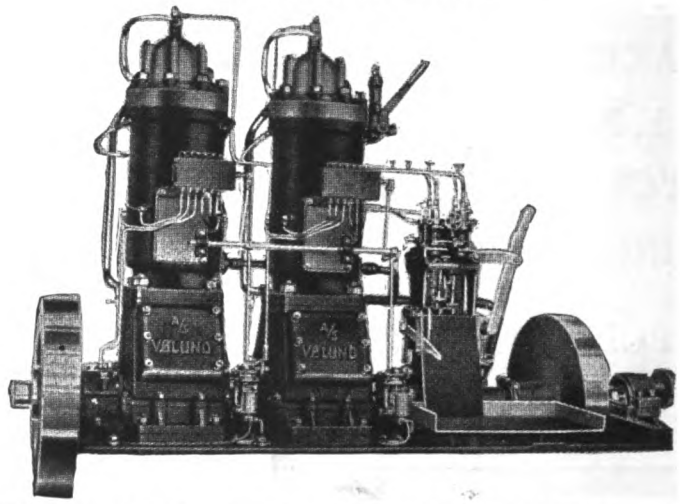
2½ Cents Per Man Per 24 Hour Day

One Year's Guarantee **Quick Delivery**

Send for Quotations

ECONOMY **SIMPLICITY** **RELIABILITY**

THREE IN ONE



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TWO-CYCLE CRUDE-OIL MOTOR

WORKS AT ⅙ OF OPERATING COST OF ANY GASOLINE MOTOR

WITHOUT WATER INJECTION

350 INSTALLATIONS IN FISHING BOATS, TUGS AND BARGES.

HANDLED BY MEN WITHOUT MECHANICAL TRAINING

CHRISTENSEN & SNETHLAGE

CUNARD BUILDING, NEW YORK CITY

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BUILDERS OF ALL
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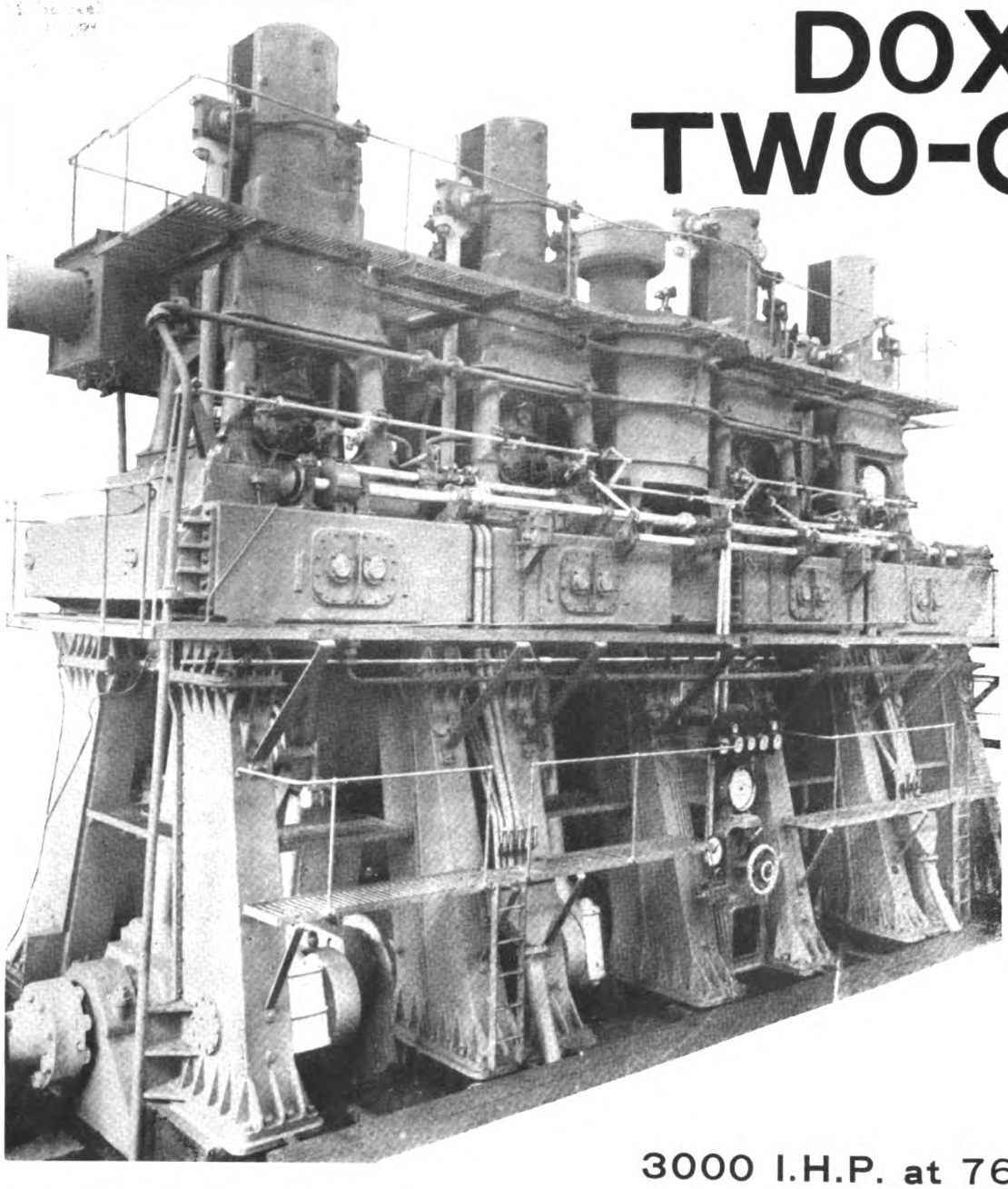
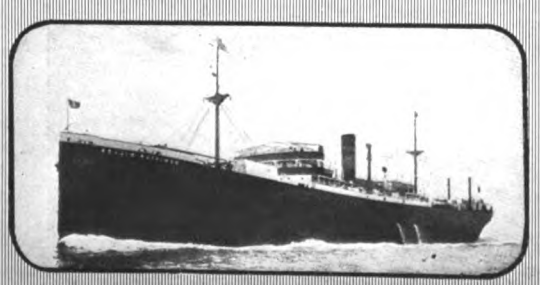


3000 I.H.P. at 76 R.P.M.
ON SINGLE SCREW

DOXFORD AND



MOTORSHIP "DOMINION MILLER"

PHILADELPHIA OFFICE
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McINTOSH & SEYMOUR CORPORATION

AUBURN, N. Y., U. S. A.

Have Furnished Heavy-Duty Diesel Marine Engines for the Following Ships

Name of Vessel	Dead Weight Tonnage
CETHANA	3300
ISLA DE JAVA	4100
CHALLAMBA	3300
CULBURRA	3300
COCHINCHINE	2500
BAYONNE	1500
COOLCHA	3300
SOLITAIRE	5000
BENOWA	4400
BALCATTA	4400
BABINDA	4400
BOOBYALLA	4400
BORRIKA	4400
MARYLAND	4500
TEXACO No. 146	1000
TEXACO No. 147	1000
J. F. PENROSE	4500
BRAMELL POINT	5000
ASTMAHCO No. 3	3000
ASTMAHCO No. 4	3000
BACOI	2500
CAROLYN FRANCES	1000
DONNA LANE	3300
KENNECOTT	6500

LOOK UP THESE VESSELS WHEN THEY ARE IN PORT

MAIN OFFICE AND WORKS

AUBURN, N. Y., U. S. A.

149 BROADWAY
New York City

700 INTERSTATE BLDG.
Kansas City, Mo.

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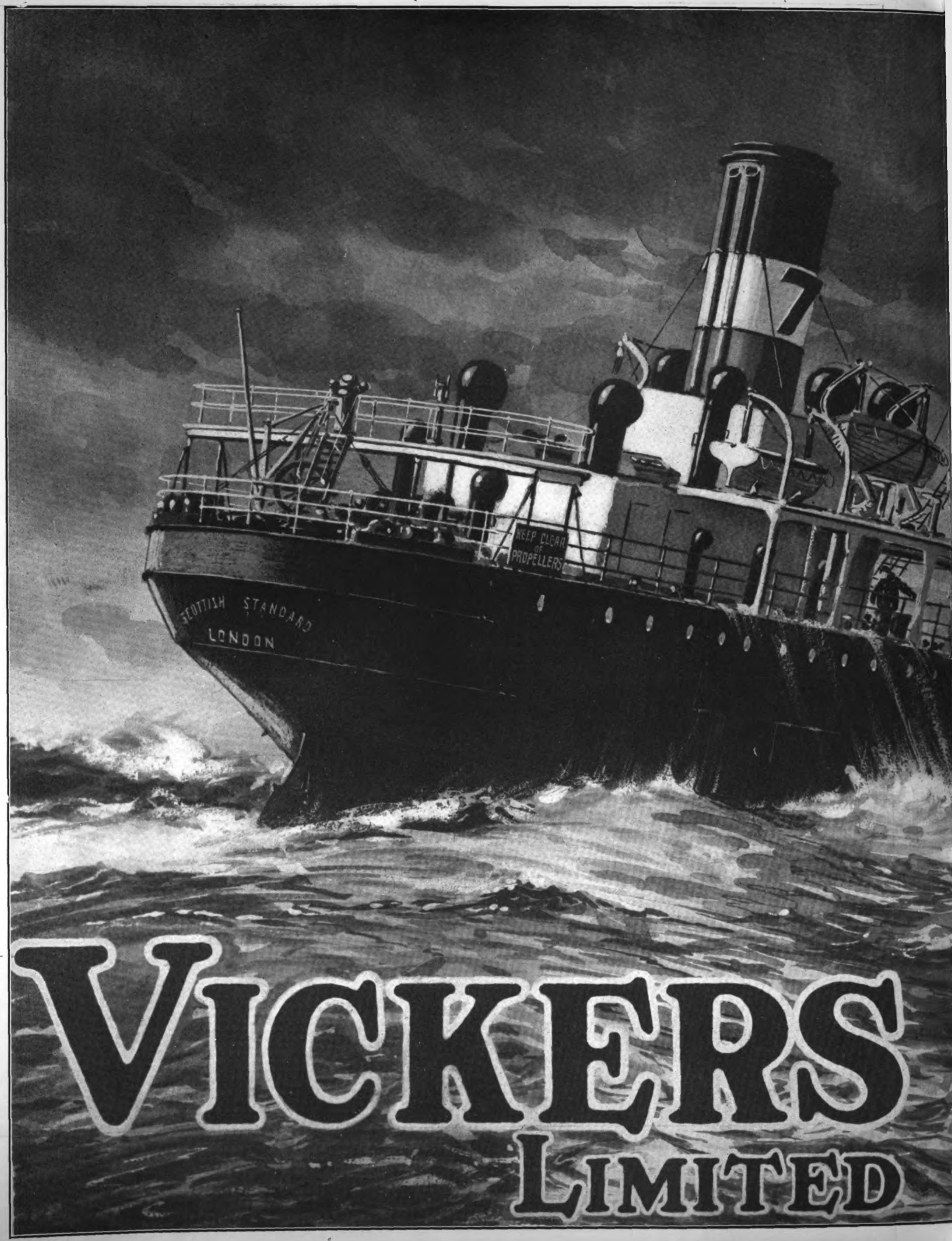

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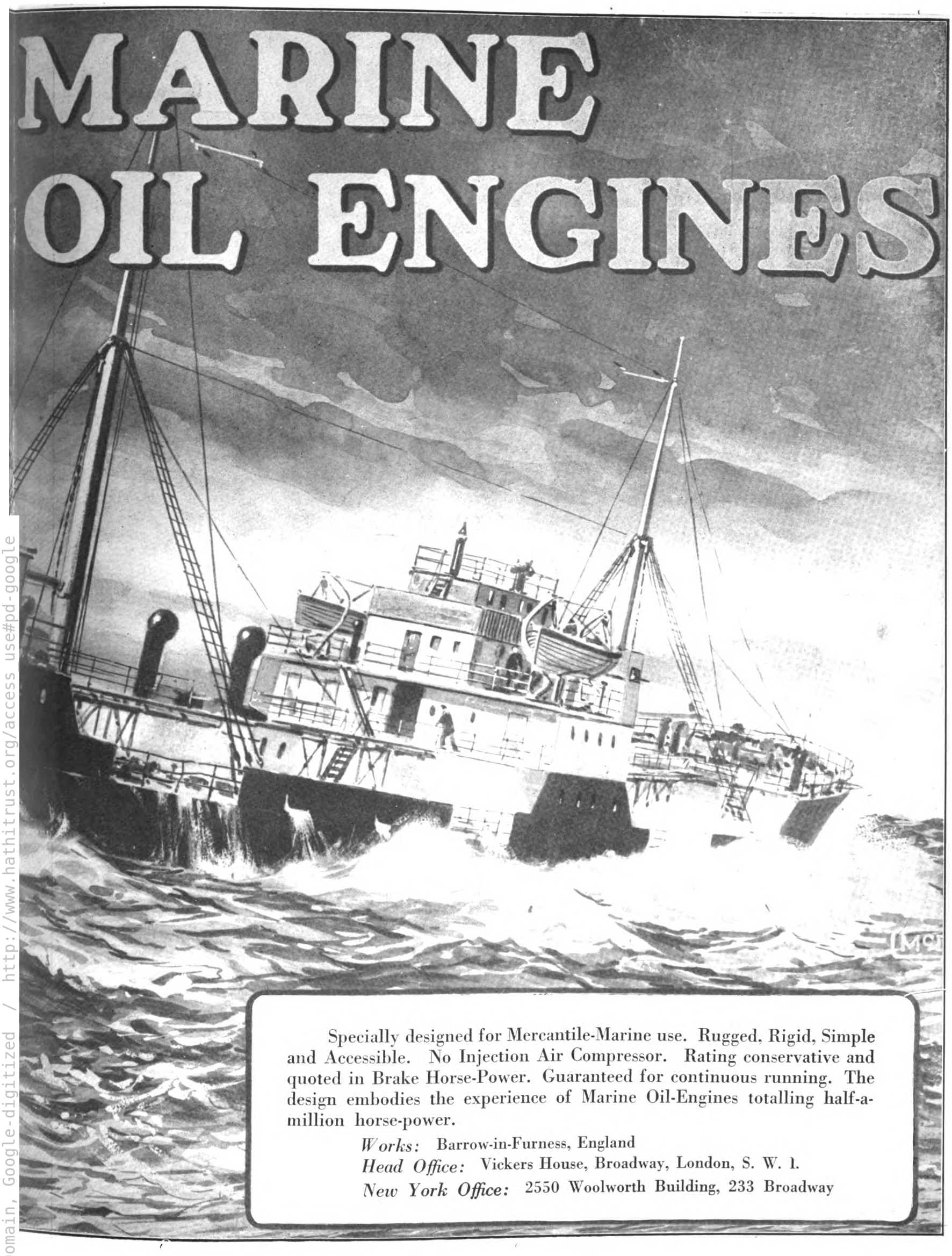

Specially designed for Mercantile-Marine use. Rugged, Rigid, Simple and Accessible. No Injection Air Compressor. Rating conservative and quoted in Brake Horse-Power. Guaranteed for continuous running. The design embodies the experience of Marine Oil-Engines totalling half-a-million horse-power.

Works: Barrow-in-Furness, England
Head Office: Vickers House, Broadway, London, S. W. 1.
New York Office: 2550 Woolworth Building, 233 Broadway

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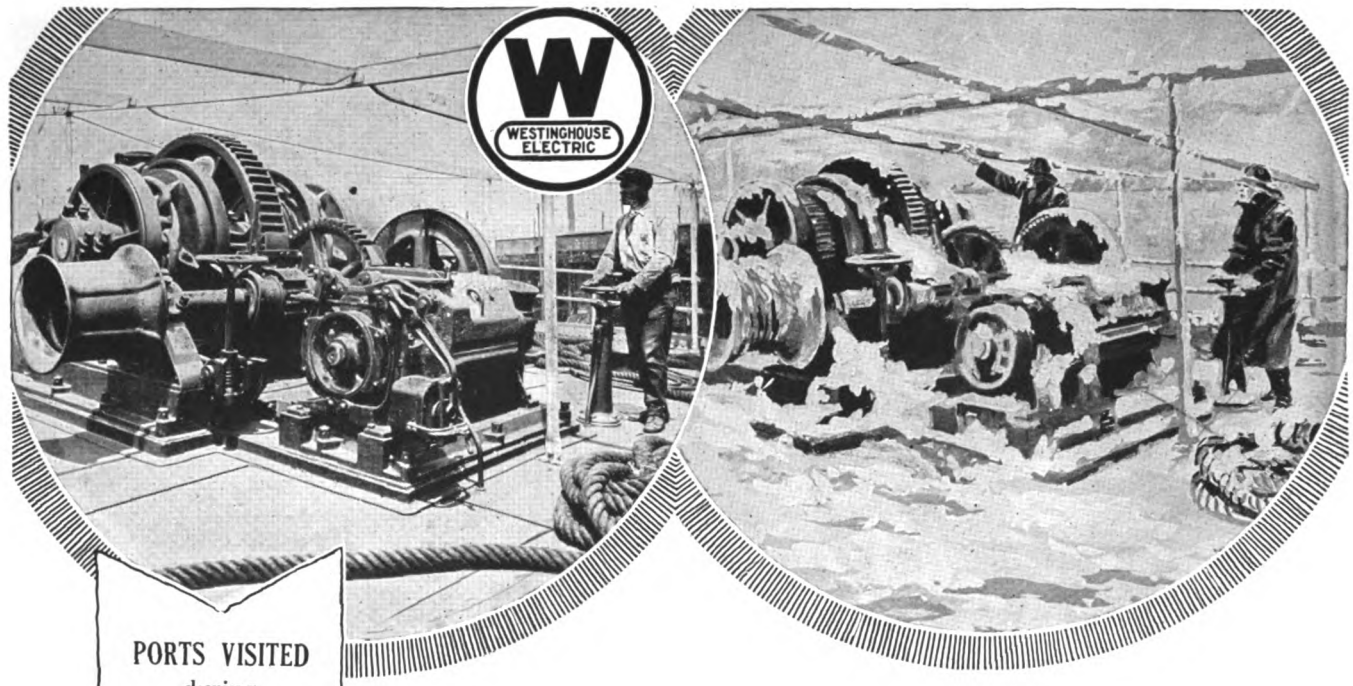

PORTS VISITED
during
Six Months' Voyage
of the
M.S. WILLIAM PENN

New York
Savannah, Ga.
Balboa
Honolulu
Yokohama
Kobe
Shanghai
Fuchow
Swalow
Hongkong
Manila
Cebu
Soerabaya, Java
Singapore
Port Said
Marseilles
London
Rotterdam
Liverpool
New York

(Trip completed in 6 months, 18 days)

A Test of Motor-Driven Auxiliaries Under All Conditions of Weather and Temperature!

IN ORDER TO GIVE AMERICAN BUILT MOTORSHIPS A THOROUGH TRIAL, THE M. S. WILLIAM PENN WAS SENT ON A TRIP AROUND THE WORLD. THE TEST CAN TRUTHFULLY BE SAID TO HAVE BEEN AN UNUSUAL AND THOROUGH ONE.

The William Penn is equipped with Westinghouse motor-driven deck auxiliaries, and, as can be seen from the list of ports visited during the six months' voyage just completed, she has taken on and discharged cargoes under every condition of weather and temperature.

The operators pronounce the equipment satisfactory in every respect and comment favorably upon the great saving in fuel as well as the simplicity with which electric-driven auxiliaries can be operated and controlled.

The dependability of this equipment is further emphasized by the fact that the total value of spare parts used during, and as a consequence of, the six months' voyage, amounted to only $1.65.

From every angle the test of this equipment has been both fair and thorough and such as to commend it to the consideration of all ship owners and operators.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.

Sales Offices in All Principal American Cities
Service Stations in Principal American Ports

Westinghouse

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Win

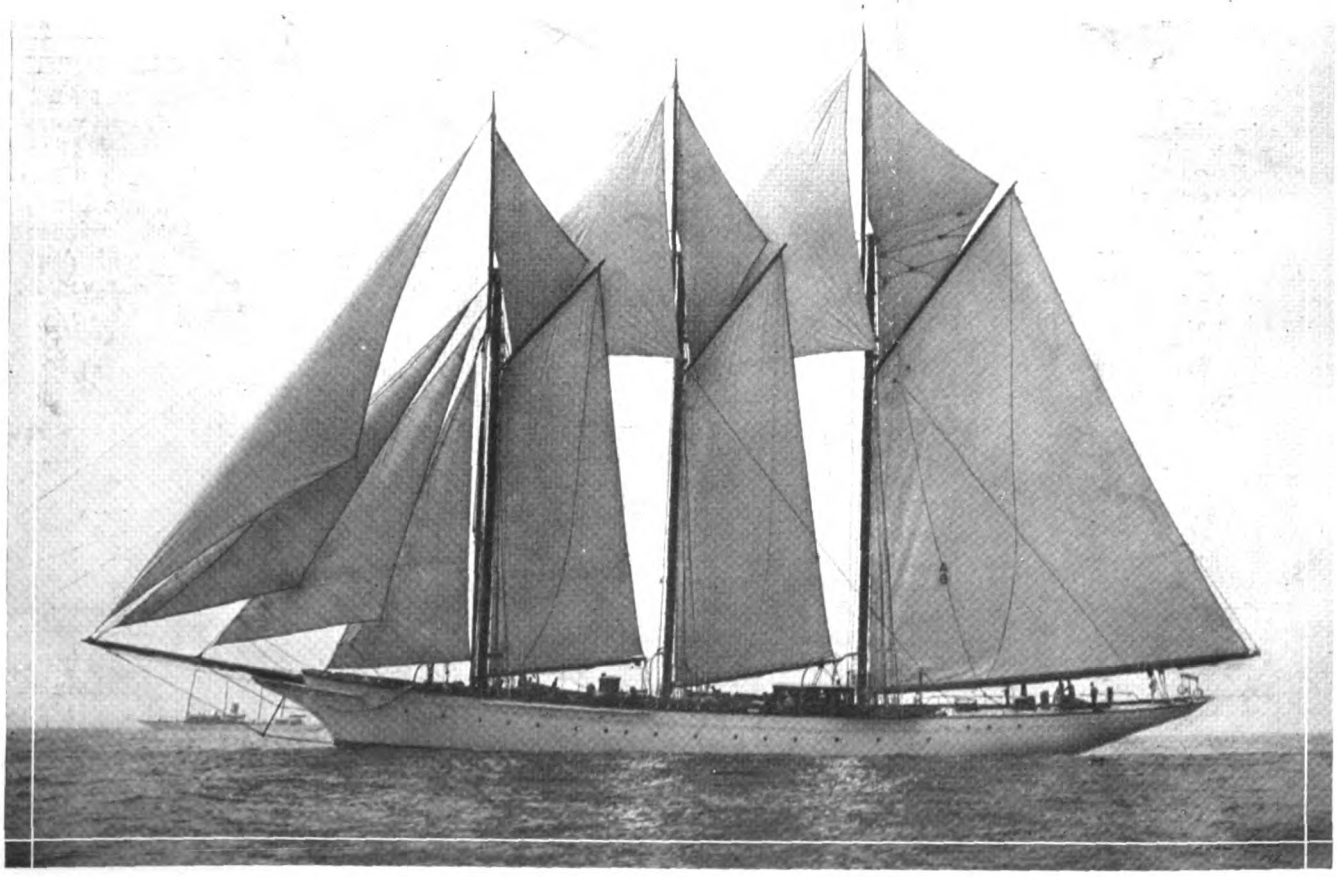
OIL DIESEL
TYPE E

"ALCYONE"—A Diesel-Electric Yacht

"Alcyone" built in 1908 by Geo. Lawley & Son Corp. from designs by Tams & King and owned by Mr. H. W. Putnam, has recently been converted from a Steam Yacht to a Diesel-Electric Yacht at the yards of the Tebo Yacht Basin.

The new power plant consists of two Winton Diesel Oil Engines, 6 Cylinder 11"x14" developing 225 H.P. at 260 R.P.M., each engine direct connected to a 140 K.W. Westinghouse Generator and a 12 K.W. Exciter, which in turn supply power to a 350 H.P. Westinghouse Driving Motor operating at 175 R.P.M. Two auxiliary Winton Generating Sets are operated by six cylinder 3"x4" Winton kerosene motors. Speed with steam plant—10 knots. Speed with Diesel-Electric Drive—11 knots.

Another striking example of the general trend towards Diesel-Electric Drive. Here is a 600 ton yacht in which the speed has been increased, cruising capacity tremendously added to, power plant space reduced, operating expenses minimized and vibration eliminated.



WINTON ENGINE WORKS,

New York—A. G. Griese, Inc., 30 Church St. *Seattle*—H. W. Starrett, Sunset Engine Co.
Washington, D. C.—R. L. Fryer, 817 Albee Bldg.

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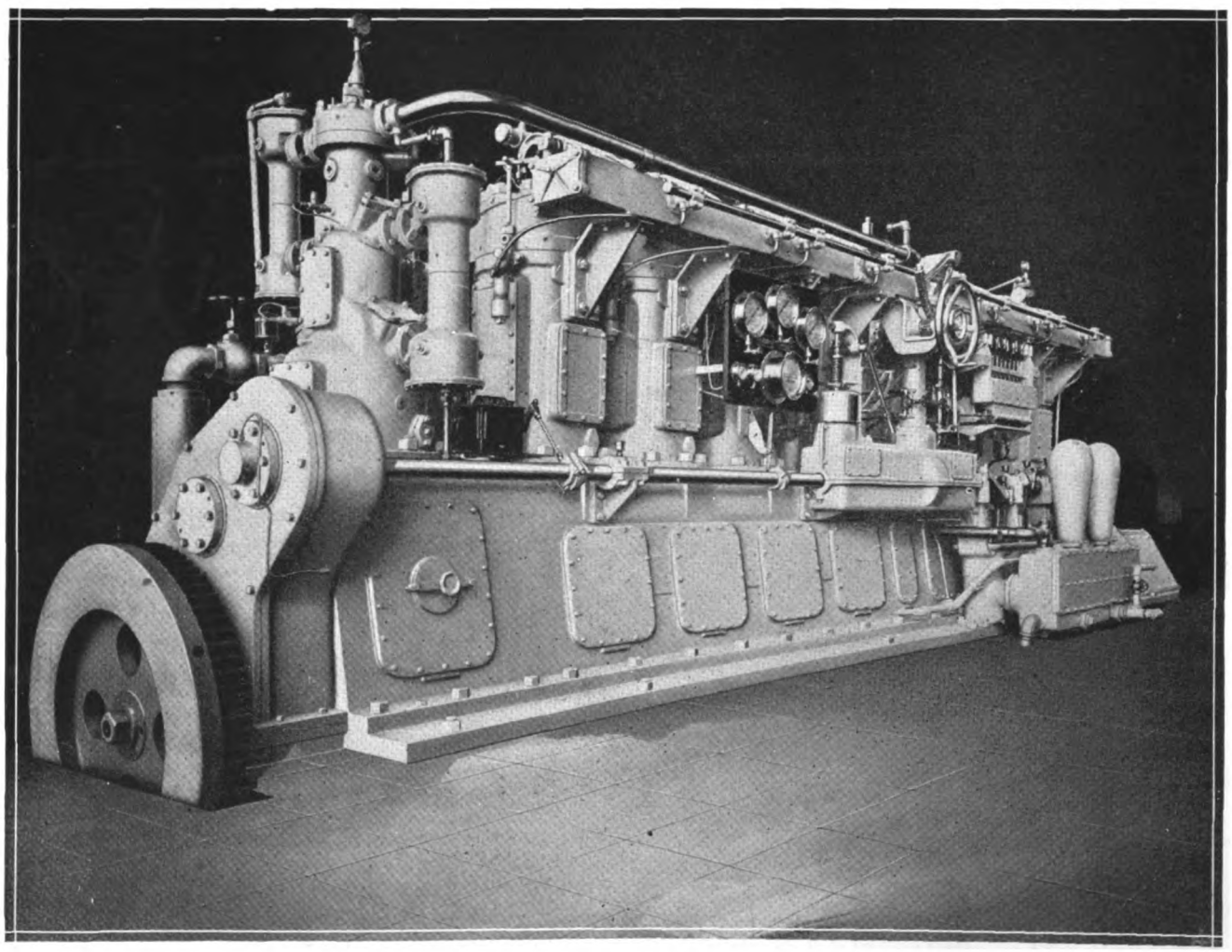
NGINES

Diesel-Electric Drive is the New Power Unit

Diesel-Electric Drive has produced such remarkable economies in actual service that it is rapidly becoming the accepted "next" type of propulsive unit. Yachts, Ferry Boats, Cargo Ships and Commercial Vessels of all types will be installing Diesel-Electric Drive simply because this type of drive is the MOST economical yet devised.

Its very compactness, flexibility and dependability puts the Diesel-Electric Drive in a class by itself, to which must be added the increase in cruising radius, reduction in crew, speed in fueling, etc., etc.



CLEVELAND, OHIO, U. S. A.

San Francisco—F. G. Bryant, 593 Market St.
New Orleans, La.—A. Baldwin Company

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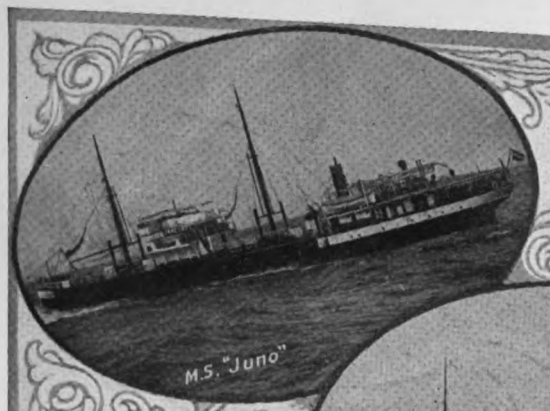
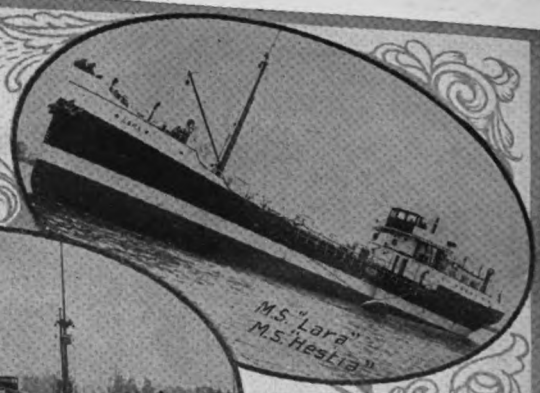
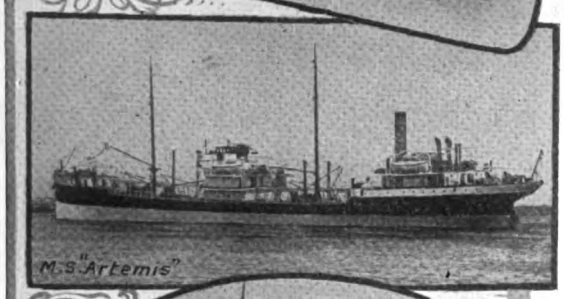
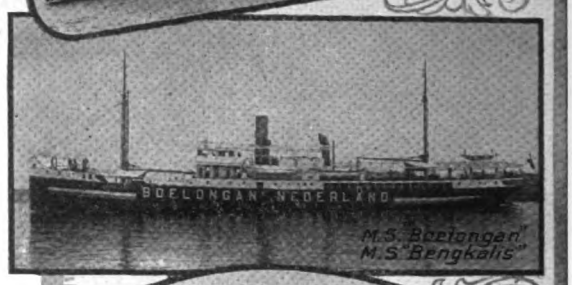
Some WERKSPOOR ENGINED MOTORSHIPS



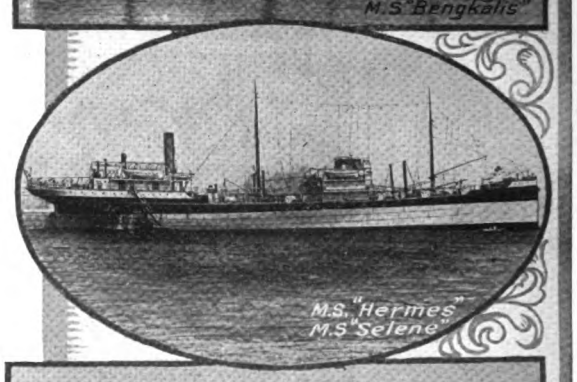






1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800

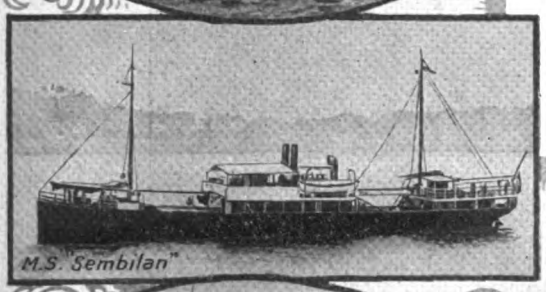


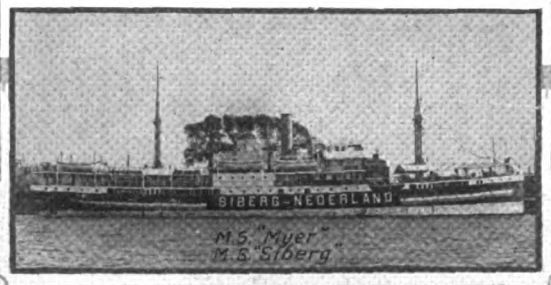
FOUR-CYCLE DIESEL ENGINES

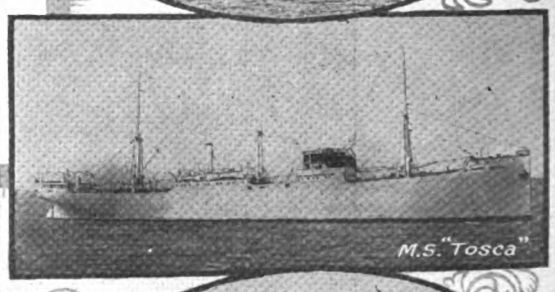
WERKSPOOR

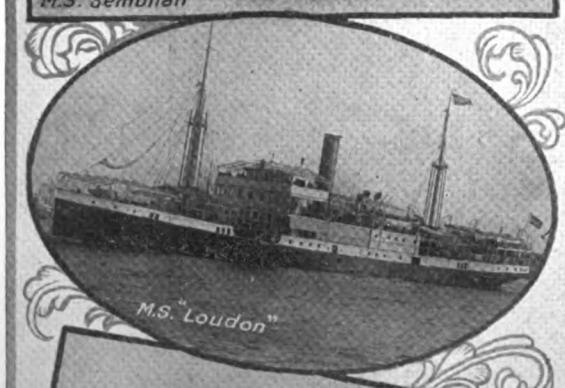
AMSTERDAM - - HOLLAND

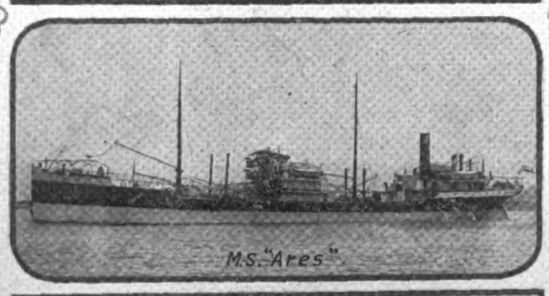
U. S. Representative:
WM. BRAAT
730 Tribune Bldg., N. Y. City

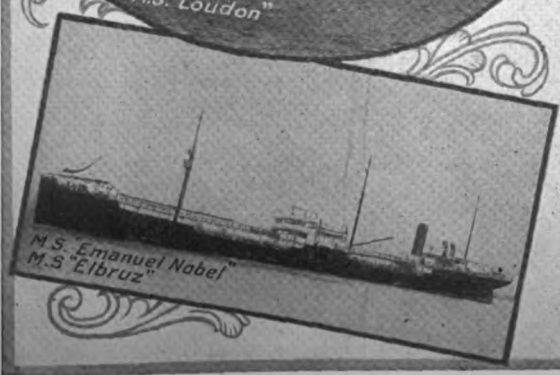


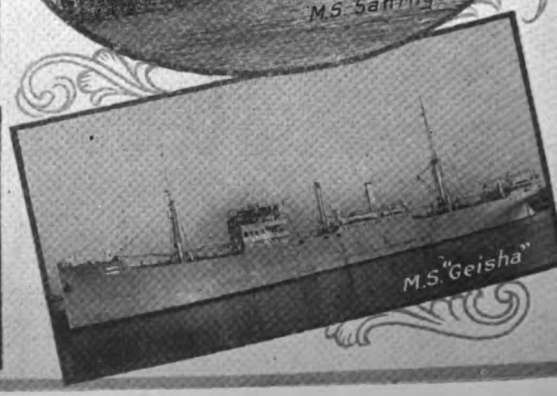












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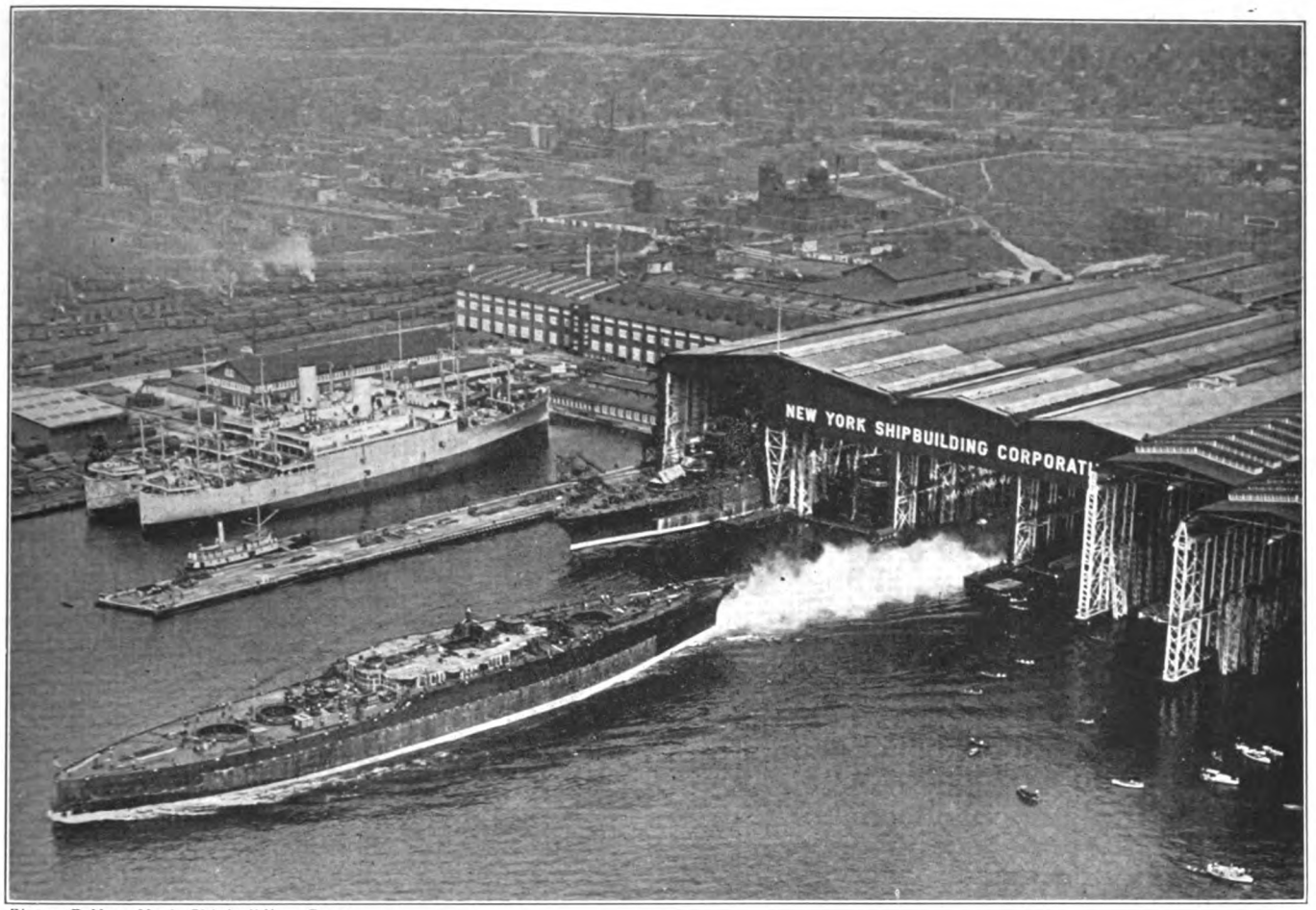
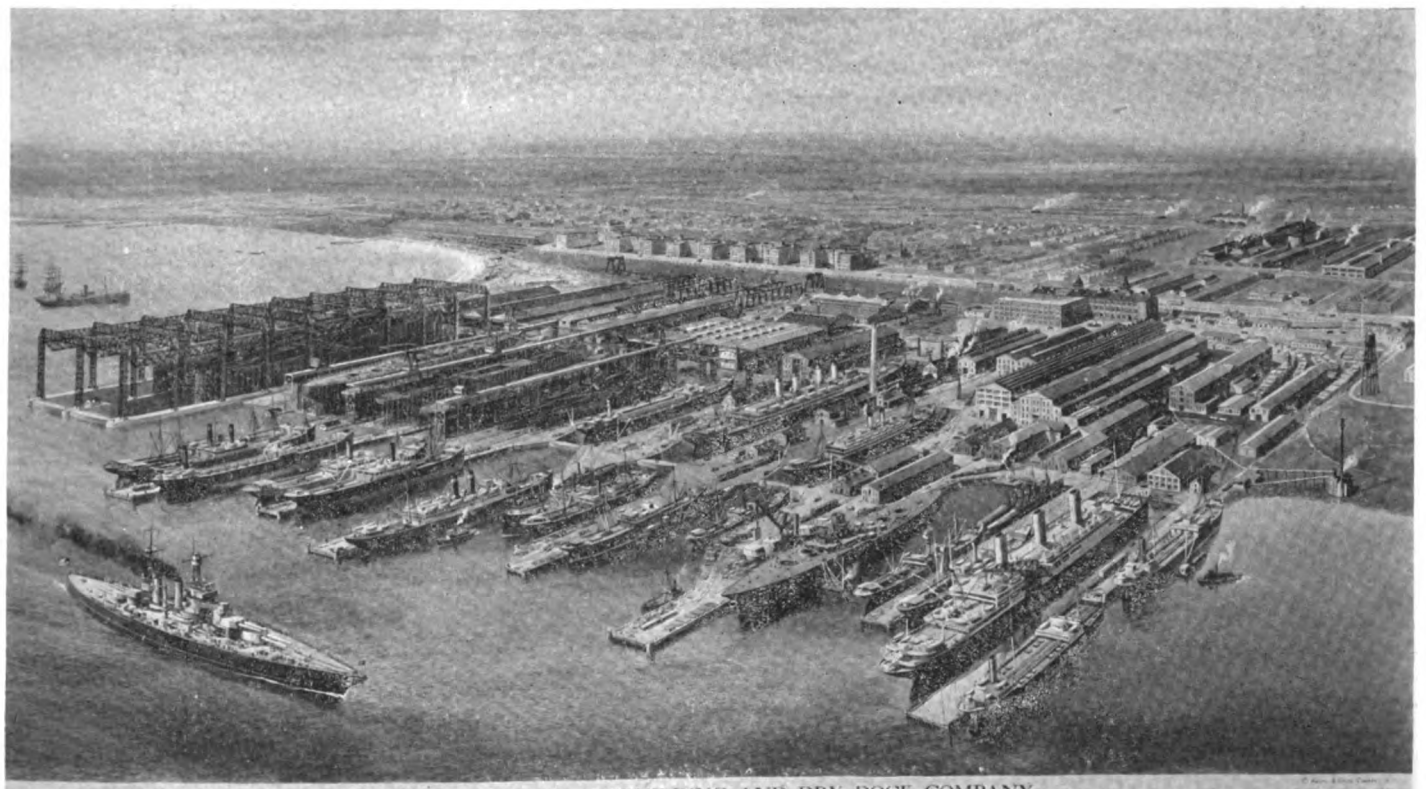


Photo. © New York Shipbuilding Corp.

NEW YORK SHIPBUILDING CORPORATION

MAIN OFFICE AND WORKS

CAMDEN, NEW JERSEY, U. S. A.



NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

NEWPORT NEWS, VIRGINIA

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

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Steel, Brass and Iron Foundries, Heavy and Light Forgings, Complete Facilities at One Plant for Doing any Ship Repair Job Quickly

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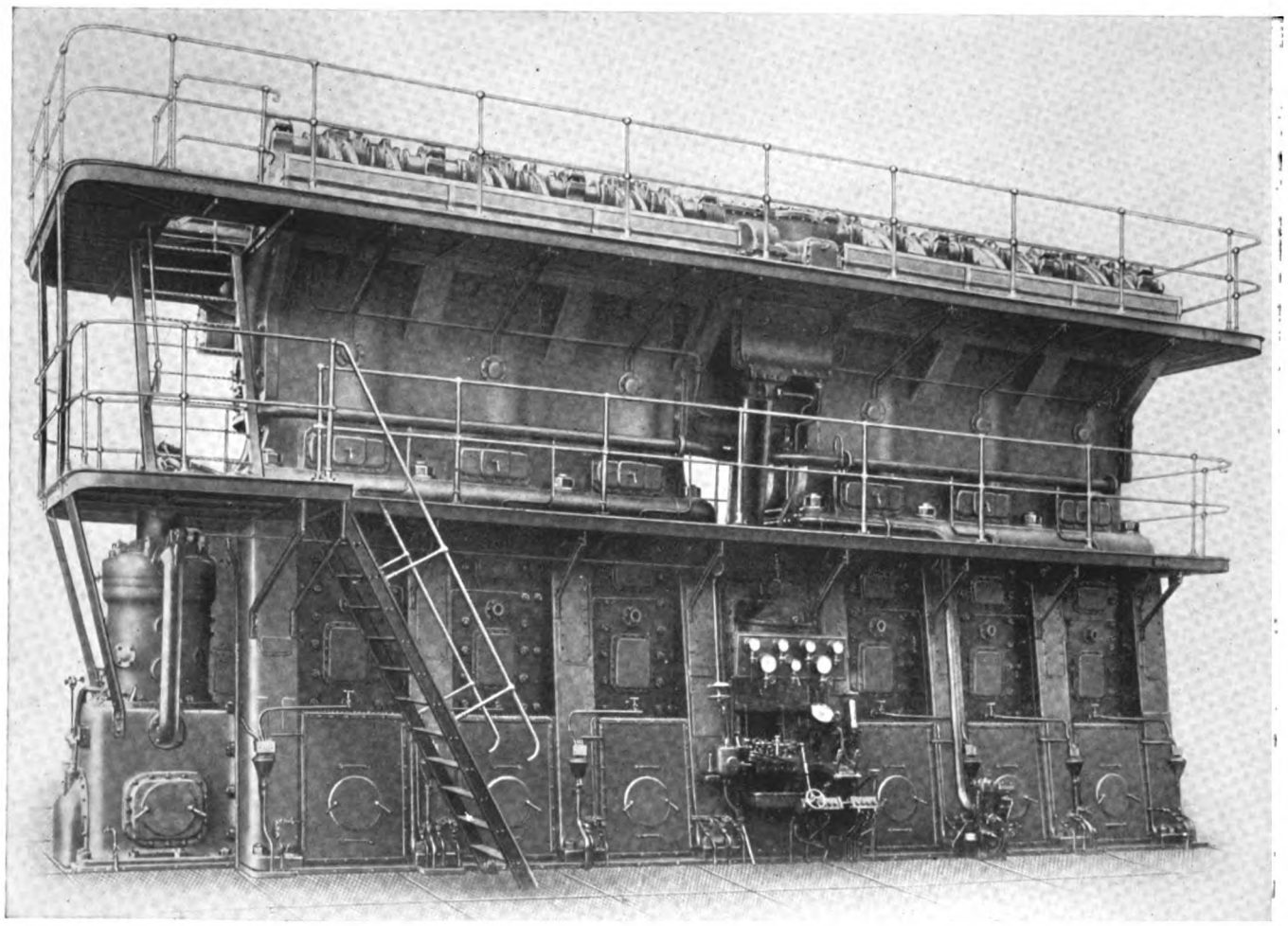
DIESEL-ENGINES

Marine, Stationary, Four-Cycle, Two-Cycle

High-Speed, Low-Speed, Light-Weight
Heavy-Weight

Direct-Drive Electric-Drive

All Sizes, 45 to 10,000 B.H.P. in One Unit



Standard Crosshead Engine, 1250 B.H.P. to 2500 B.H.P.

AMERICAN KRUPP-SYSTEM DIESEL ENGINE CO.

165 BROADWAY, NEW YORK CITY

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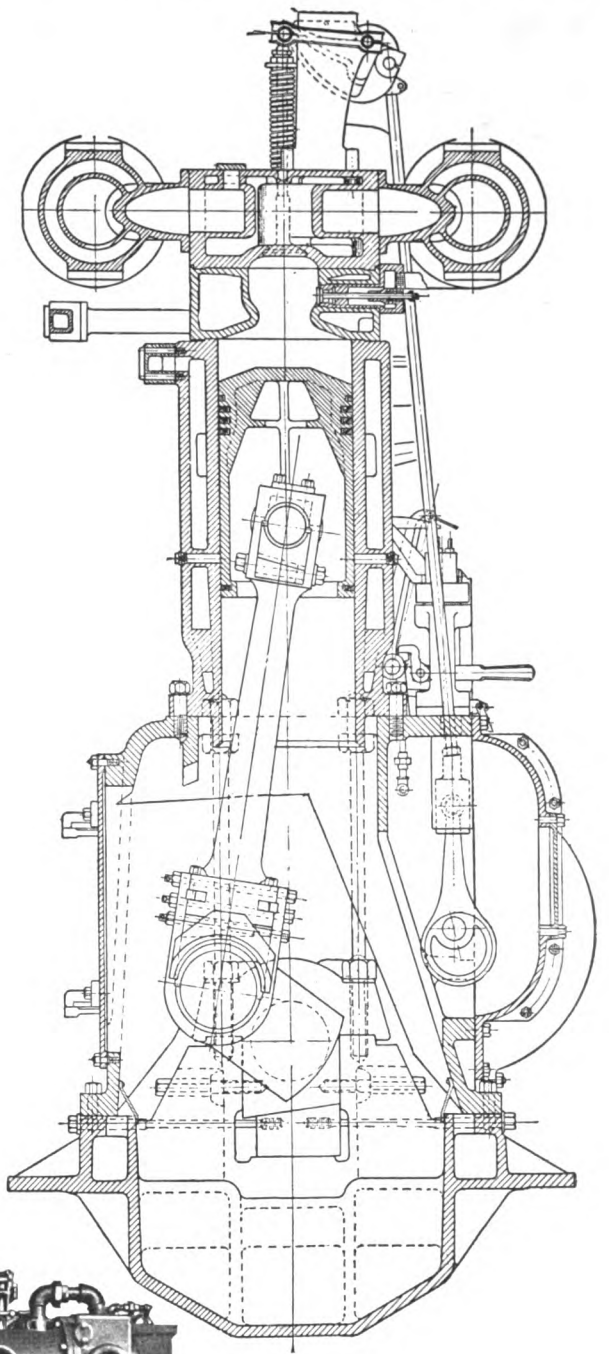
The Simplicity of Price-Rathbun Marine Oil Engines



Ease of control and rapidity of manœuvring are characteristic of Price-Rathbun Marine Oil Engines.

Reversing is accomplished by interchanging the functions of the exhaust and intake valves—there is no shifting of the cam shaft.

Seven seconds is the average time required for reversing from full speed ahead to full speed astern.

No high pressure injection air compressor is required with Price-Rathbun Engines. Fuel Injection is positive and direct, atomization being obtained without the use of compressed air. The elimination of the complicated high pressure injection air compressor and piping, saves fuel and reduces the chances of breakdown.

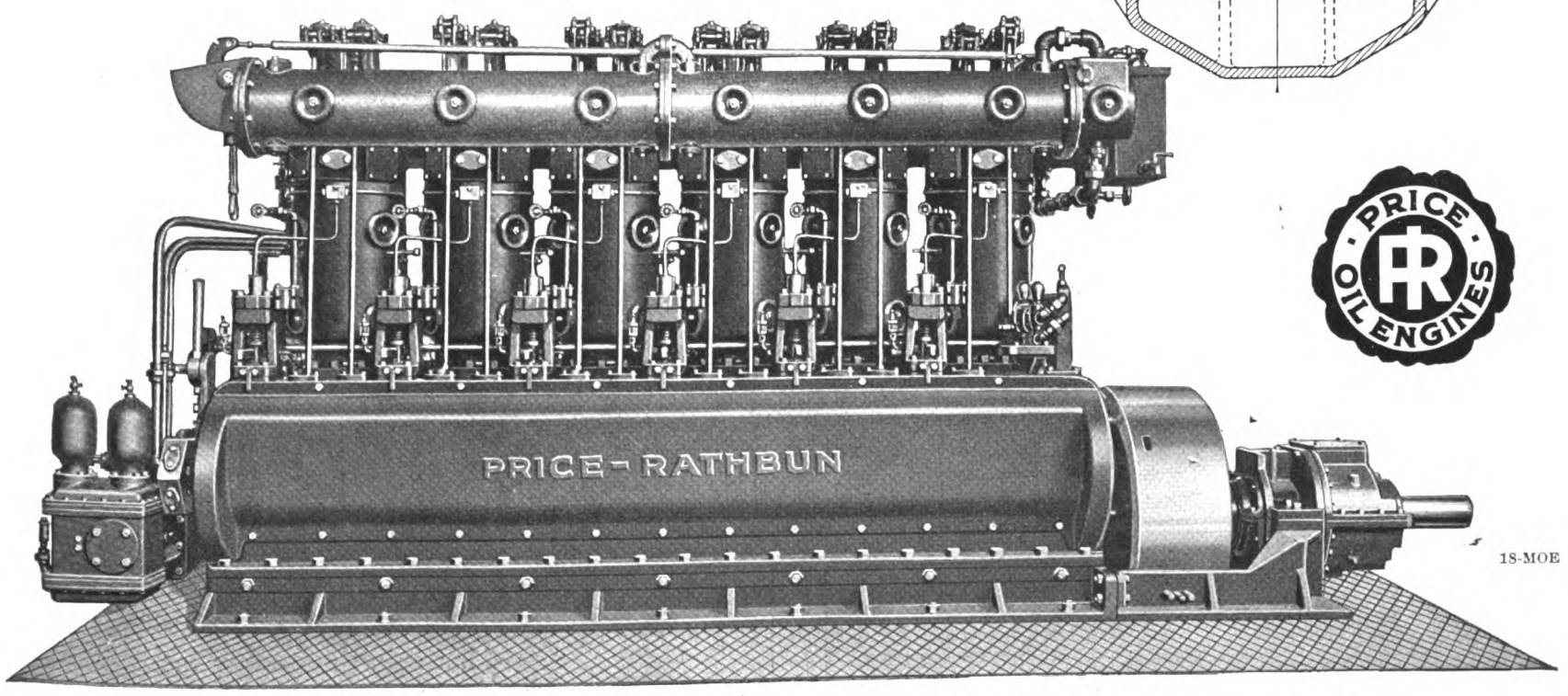
There are no hot bulbs nor plates or blow touches as ignition is accomplished by temperature of compression *only*.

High fuel economy and the low consumption of lubricating oil combined with overall simplicity and ruggedness commend the Price-Rathbun Marine Oil Engine for installations requiring from 220 to 750 brake horse power.

Bulletin 10,002

INGERSOLL RAND COMPANY, 11 Broadway, New York City

Butte	El Paso	Knoxville	Cleveland	Philadelphia
Birmingham	Seattle	Scranton	Pittsburgh	San Francisco
Duluth	St. Louis	London	Los Angeles	Salt Lake City
Denver	Chicago	Paris	Detroit	Joplin
Boston	New York	Houghton	New Orleans	Dallas



PRICE OIL ENGINES

18-MOE

Ingersoll-Rand

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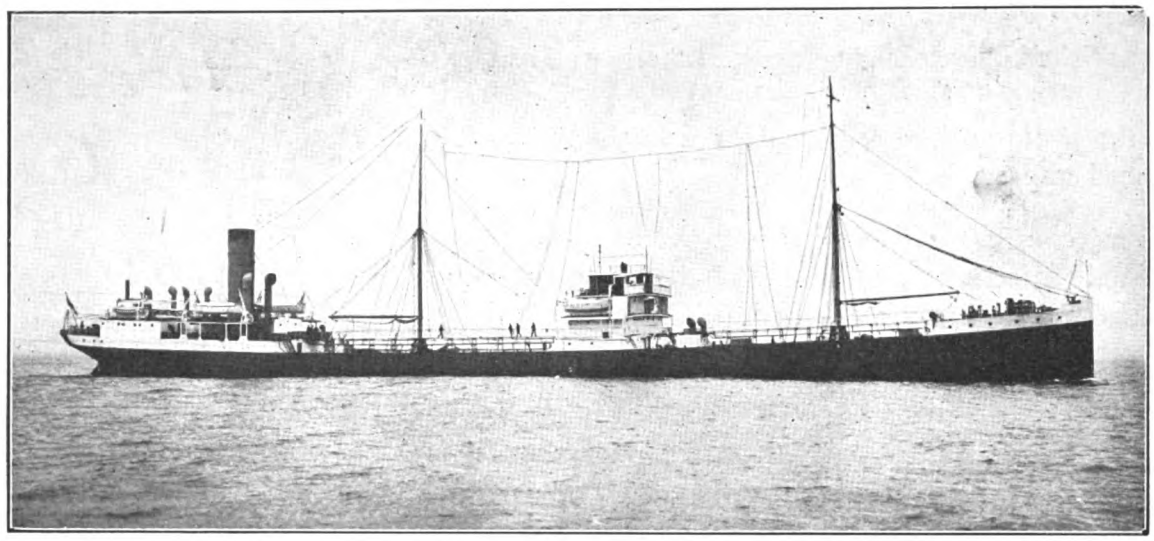
OIL FUEL

THE FUEL OF THE 20th CENTURY

Efficiency *Economy* *Cleanliness*



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The Asiatic Petroleum Co., Ltd.

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Balik Pappan
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Jarrow on Tyne
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La Guayra (Venezuela)
Las Palmas
Leghorn
Liverpool
Lisbon
London (Shellhaven & Thameshaven)
Macassar
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Perim
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Piraeus
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Port Said
Port Soudan
Pulo Bukom
Puloe Samboe
Rotterdam
Rouen
Rio de Janeiro
Sabang
Saigon
Saitozaki
Salina Cruz (Pacific)
San Francisco
San Pedro
Santos
Seattle (Washington)
Shanghai
Singapore
Soerabaya
Southampton
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Stöckholm
Suez
Sydney
Svolvaer
Tampico
Tarakan
Trieste
Trinidad
Tuxpan
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Vancouver
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Yokohama

And New Stations are expected to be ready shortly at

Antofagasta
Bordeaux
Cebu
Constantinople
Dunkirk
Durban
Funchal (Madeira)
Hamburg
Havre
Ilo Ilo
Iquique
Port Louis
Port St. Louis Du Rhone
San Juan (Porto Rico)
St. Vincent
St. Nazaire
Vado

BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N.Y., U.S.A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

THE Asiatic Petroleum Company also supply **Kerosene Oil** for use in the smaller Internal-combustion Engines and are prepared to supply **Petroleum Spirits, Lubricating Oils, Wax** and **Greases** in all Far Eastern Markets.

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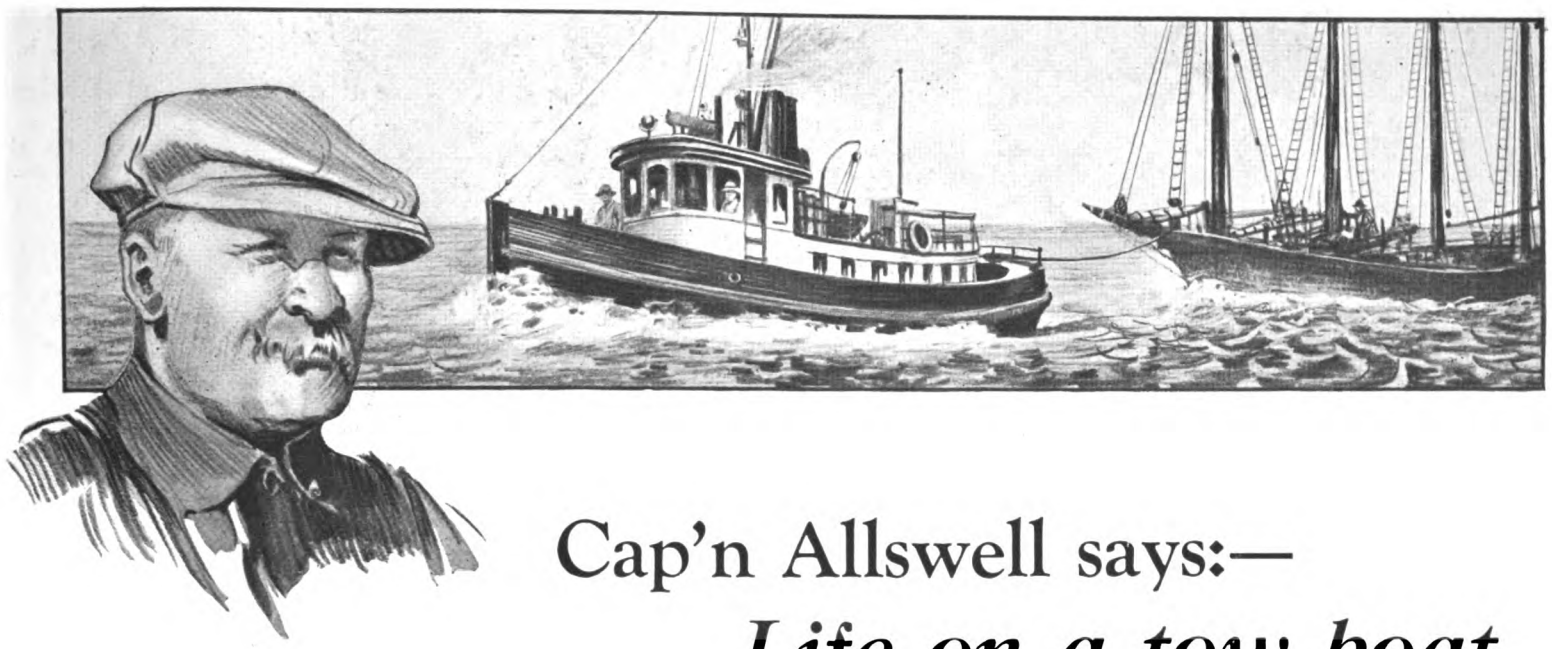


Cap'n Allswell says:—

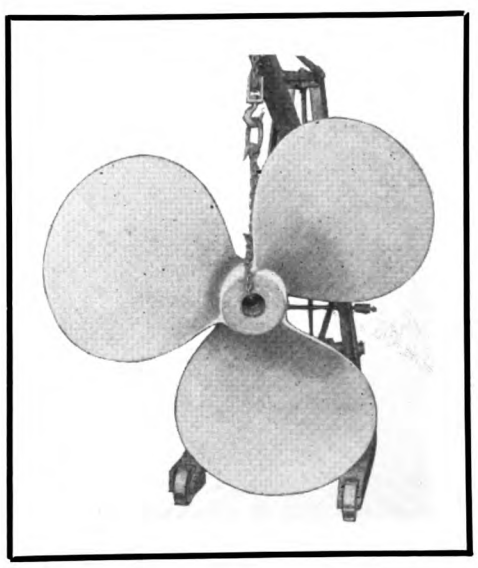
Life on a tow boat is no rest cure!

YOU'VE got to be on the job day and night, cruising around for your ship. When you do pick her up there's a man-sized job ahead. Hard work for the crew, engine and propeller, with no let-up between you and the dock.

A tow boat's got to have a lot of power and control to stay in the game and it's there, a propeller shows its bringing up.

Columbian wheels are built and balanced to bring out all the power and speed the engine develops. And as for strength, they tell me Columbian propellers are made of Manganese Bronze that tests over 65,000 lbs. to the square inch. Don't see how they can make 'em any better, do you?

Send for Columbian Book. There's a propeller for every type of boat.



THE COLUMBIAN BRONZE CORP.

218 North Main St., Freeport, Long Island, N. Y.

New York City Sales Only: 44 Third Avenue

COLUMBIAN *Bronze* PROPELLERS

for every craft afloat

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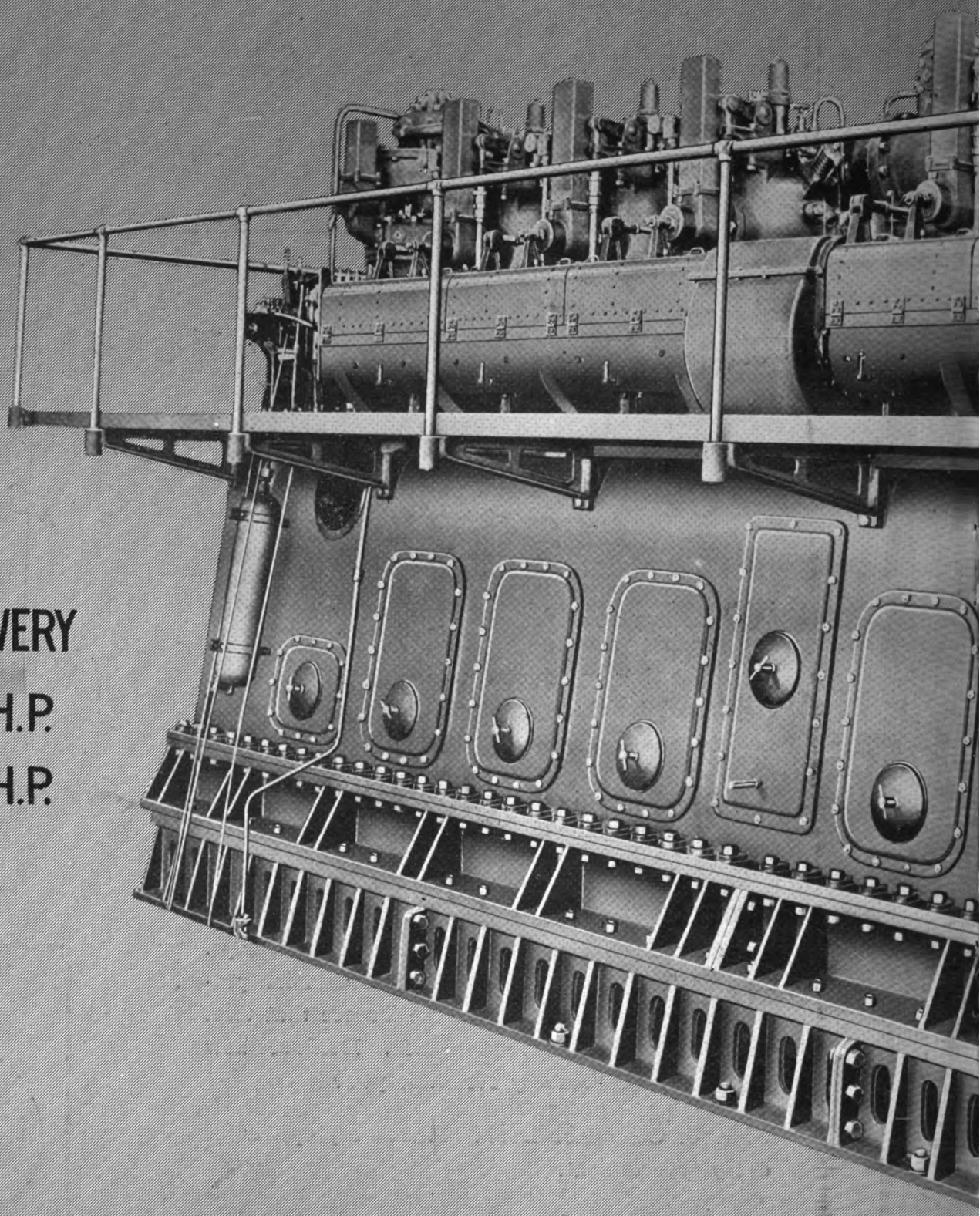
NELSECO DIESEL ENGIN



SIZES
FOR EARLY DELIVERY
120 H.P., 180 H.P.
240 H.P., 360 H.P.
480 H.P.

600-750 B.H.P., 225 R.P.M., 4 cycle, 6 cylinders
HEAVY-DUTY MARINE OR STATIONARY DIESEL ENGINE

NELSECO

New London Ship
Groton.

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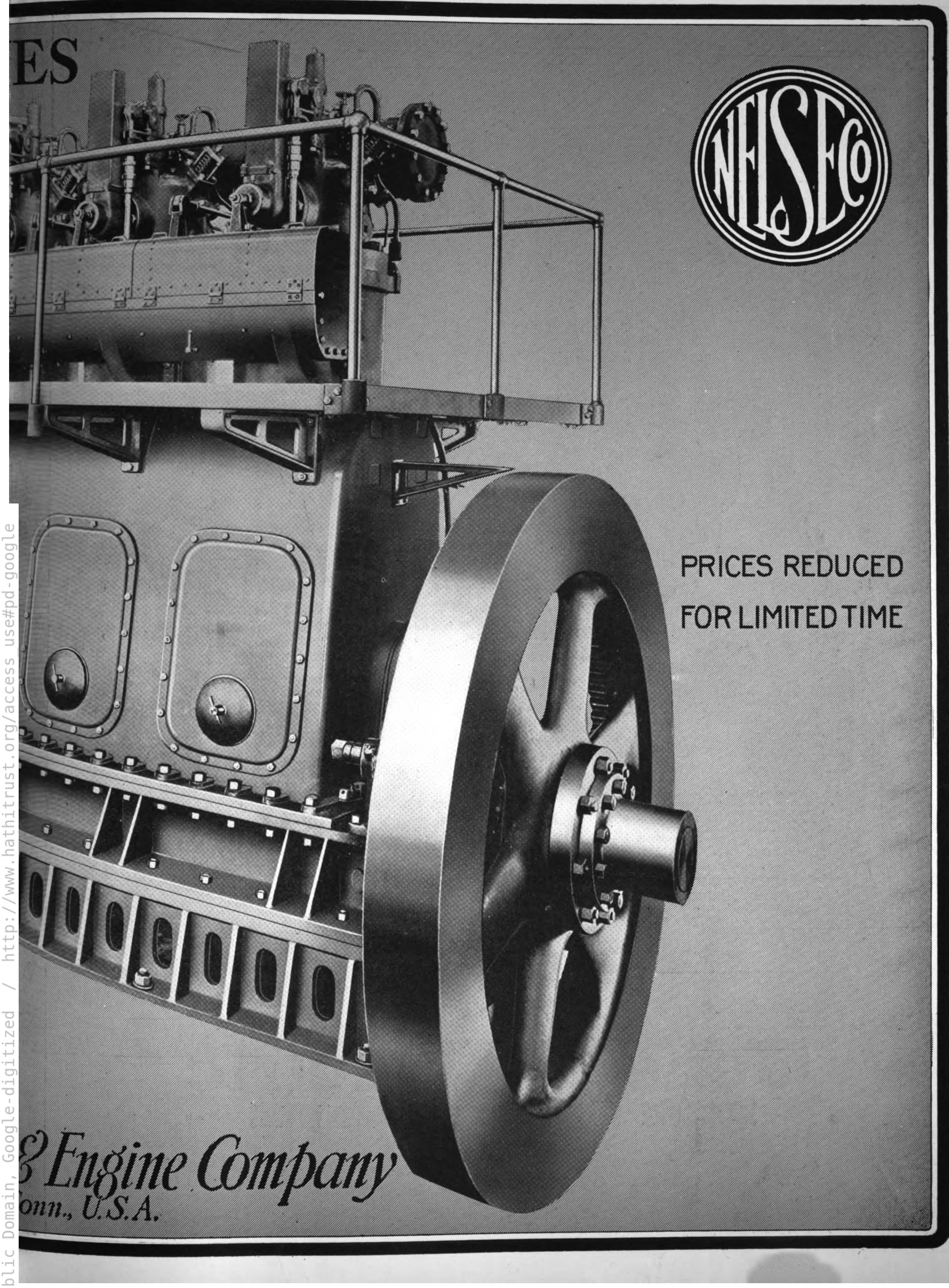

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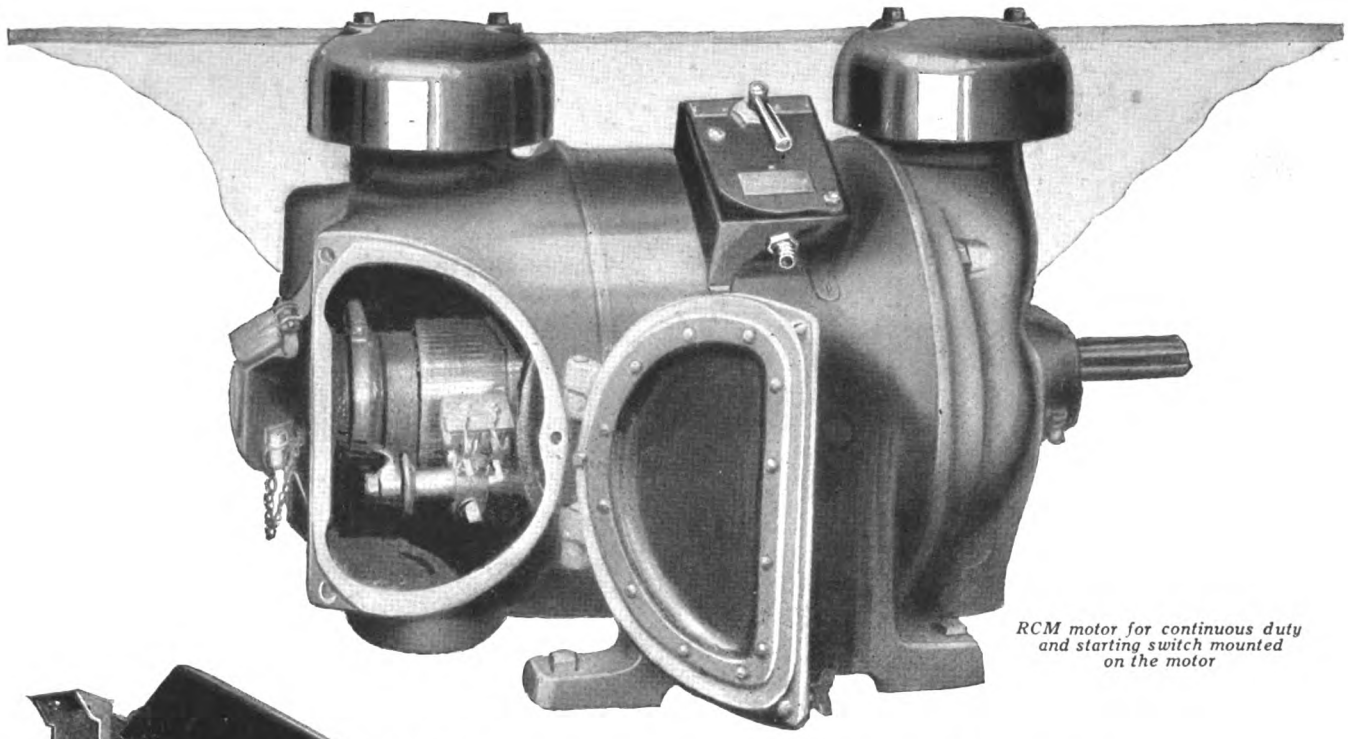
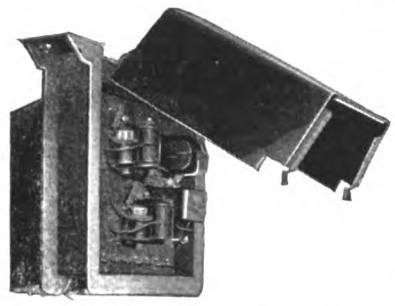
Built for a Ship's Engine Room



RCM motor for continuous duty and starting switch mounted on the motor



Automatic Control Panel for continuous-duty motor. Its design permits deck or bulkhead mounting, and the starting switch can be located wherever desired

You can depend on this motor

NO one questions the importance of a dependable drive for below-deck auxiliaries—machinery vital to the operation of a ship and which must work continuously for weeks, day and night.

Electric drive for these auxiliaries is reliable, but standard land motors and control are out of place on a ship. Electrical equipment exposed to salt air, water and oil spray, drippings from condensation and leaky pipes, and damage by rodents—the every-day conditions aboard ship—requires special protection. The RCM Motor is designed for just such service.

This motor is totally enclosed and self-ventilated, has moisture-proof insulation, special type bearings, special frame and fittings, and is non-corrodible throughout. Its control apparatus has features which make it just as fit for the service.

G-E MARINE EQUIPMENT
TO MEET YOUR REQUIREMENTS
Electric Drive for Motorships
Turbine-Electric Drive
Marine Geared Turbines
Electric Drive for Auxiliaries

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

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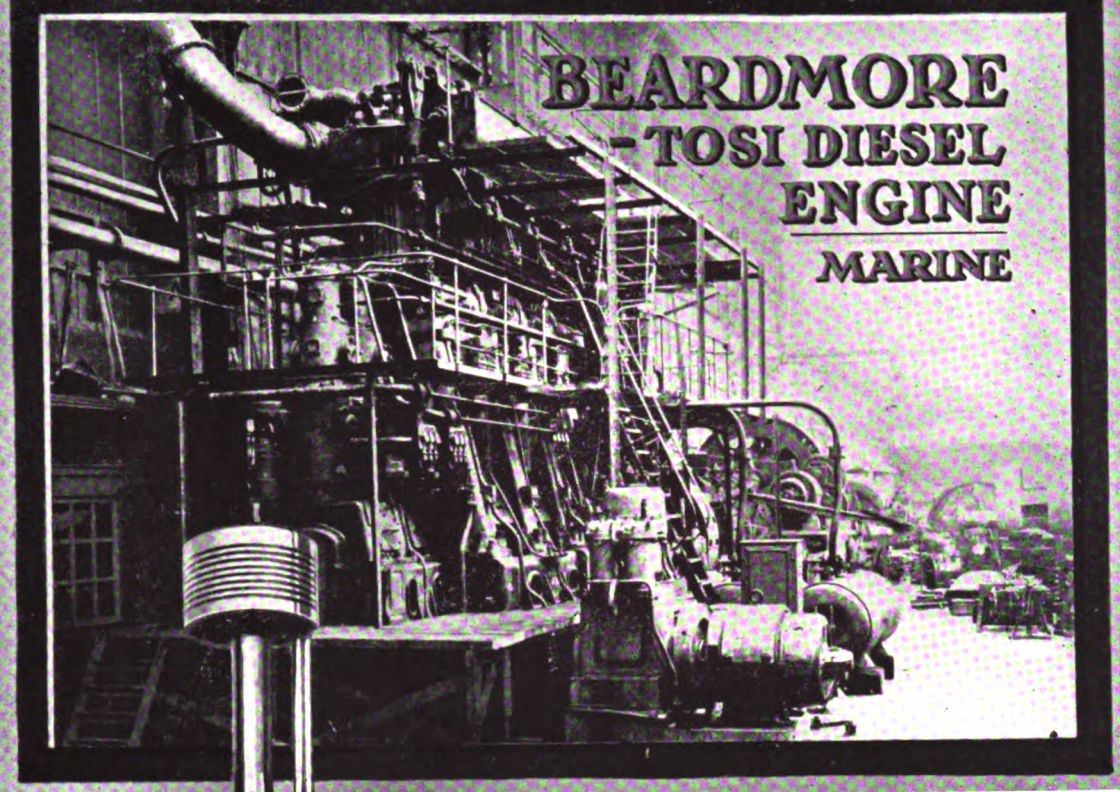
WILLIAM

BEARDMORE

AND COMPANY LIMITED



Embodies the latest and most approved Diesel Engine practice

Extract from "The Engineer," November 11th 1921.

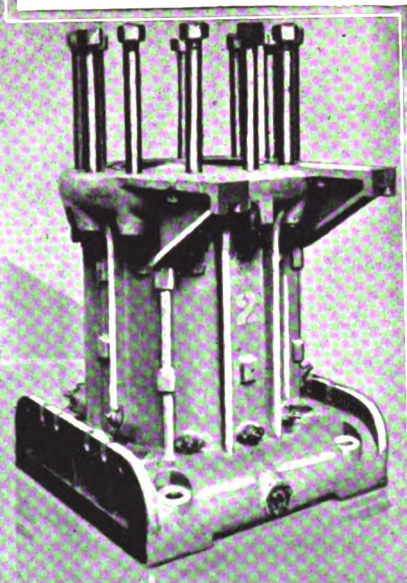
"The Beardmore-Tosi Engine marks a distinct advance in four-cycle engine construction."

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

PATENT VALVE GEAR

EXHAUST VALVE TROUBLES ELIMINATED

PATENT CYLINDER HEAD AND COOLING ARRANGEMENTS



Results of 100 Hours' Trial

Average B. H. P.	1,276
Mechanical efficiency, per cent	77
Average I. H. P.	1,646
Revolutions per minute	124
Mean pressure on B. H. P. basis, lb. per sq inch	75.5
Fuel consumption, lb. per P. H. P. per hour	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. F.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average	125
Piston cooling water, outlet temperature deg. Fah., average	130
Blast air pressure, lb. per square inch	1,000

NAVAL CONSTRUCTION WORKS

DALMUIR NEAR **GLASGOW**

Full Particulars, Catalogues ——— on request

Cable Address: "Beardmore, Glasgow." Codes: Liebers; Western Union, Bentley's: A1, A B C 5th Edition

LONDON, 36 VICTORIA ST., S. W. 1

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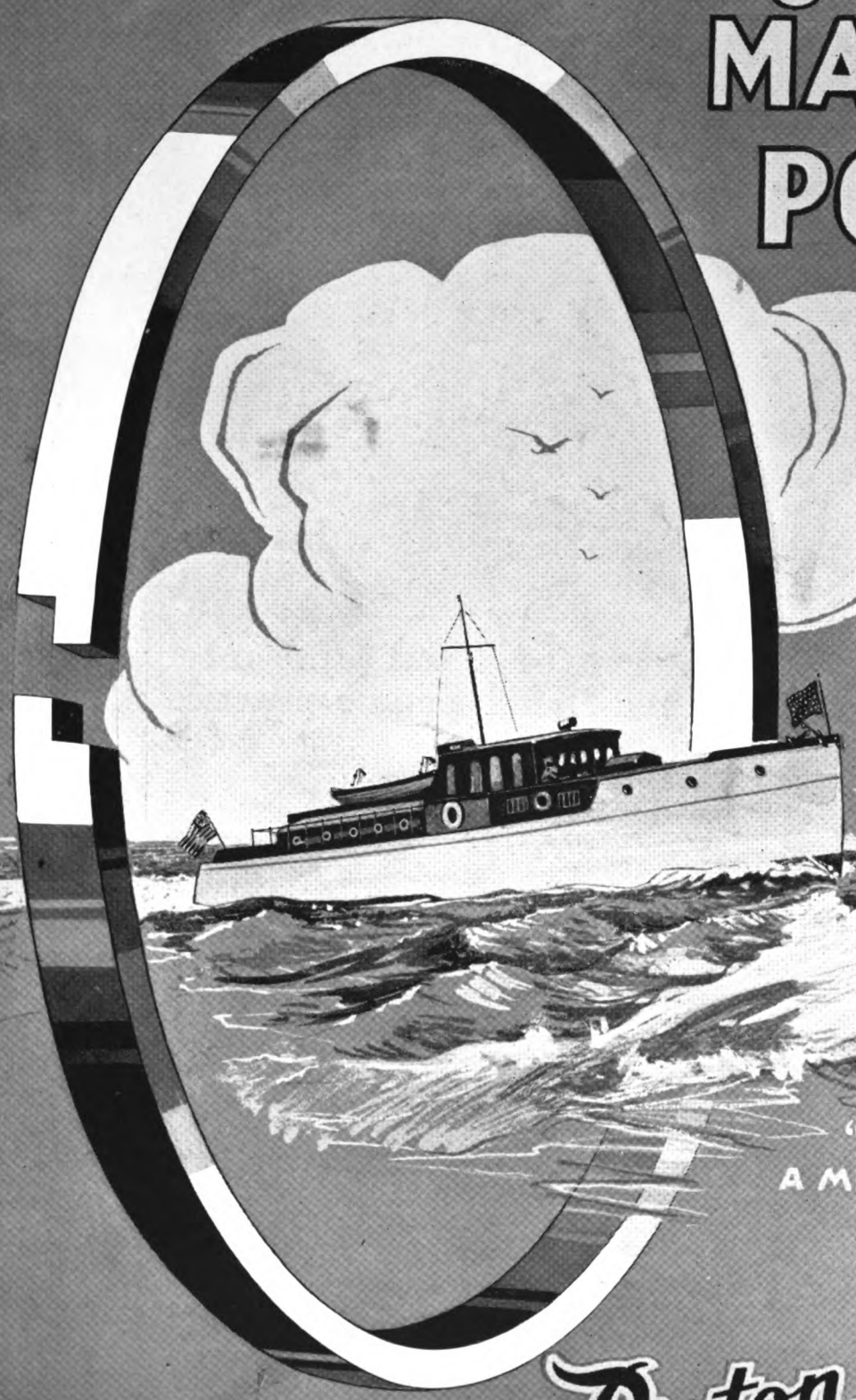
QUALITY SNAP RINGS — give MAXIMUM POWER



"MORE THAN A MILLION A MONTH"

THE Piston RING COMPANY

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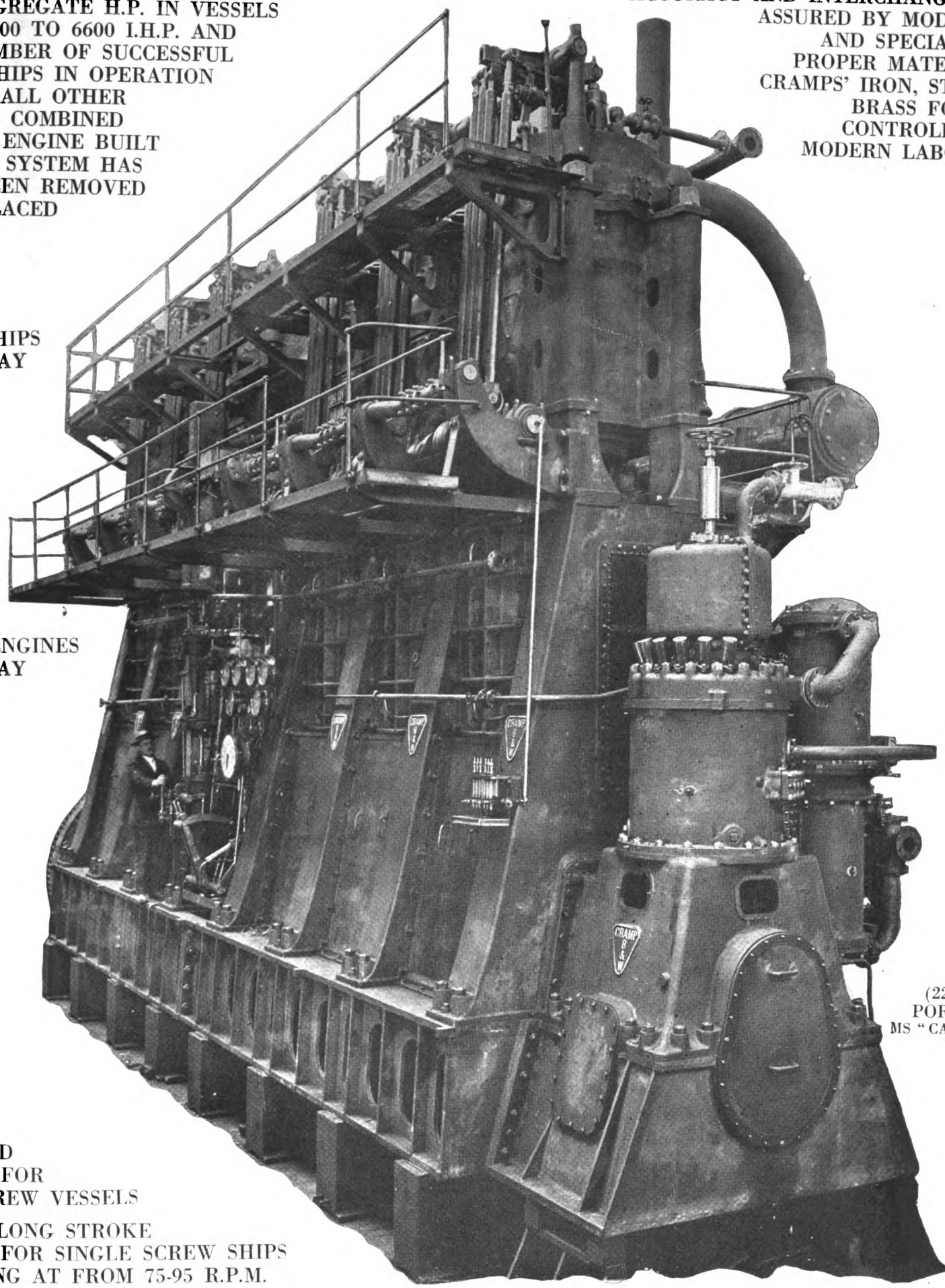
UNDER THE B. & W. SYSTEM
THE AGGREGATE H.P. IN VESSELS
FROM 1500 TO 6600 I.H.P. AND
THE NUMBER OF SUCCESSFUL
MOTORSHIPS IN OPERATION
EXCEED ALL OTHER
SYSTEMS COMBINED
AND NO ENGINE BUILT
TO THIS SYSTEM HAS
EVER BEEN REMOVED
OR REPLACED

ACCURACY AND INTERCHANGEABILITY
ASSURED BY MODERN JIGS
AND SPECIAL TOOLS;
PROPER MATERIALS BY
CRAMPS' IRON, STEEL AND
BRASS FOUNDRIES
CONTROLLED BY A
MODERN LABORATORY

MOTORSHIPS
THAT STAY
ON THE
SEAS

DIESEL ENGINES
THAT STAY
IN THE
SHIPS



(2250 I.H.P.)
PORT ENGINE
MS "CALIFORNIAN"

STANDARD
ENGINES FOR
TWIN SCREW VESSELS

SPECIAL LONG STROKE
ENGINES FOR SINGLE SCREW SHIPS
OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE

(Burmeister & Wain System)

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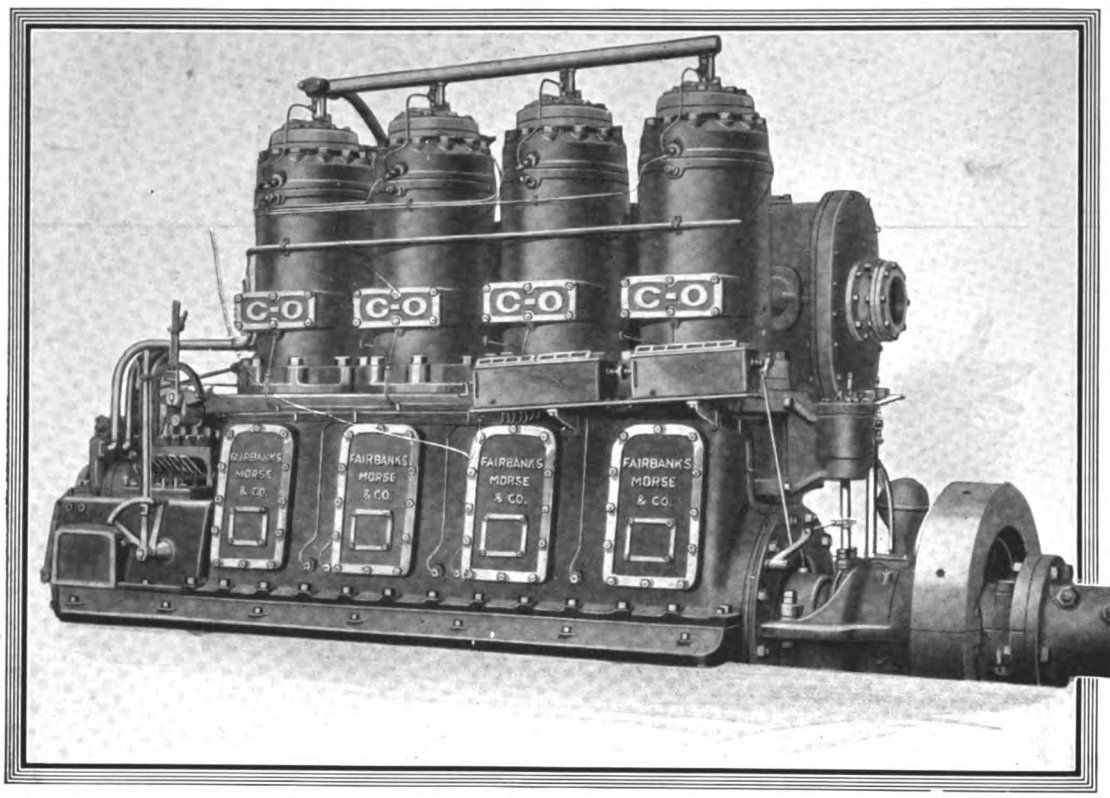
Fairbanks-Morse "C-O" Marine Oil Engines



Use Low Priced Fuel Oils For Workboat Power

"C-O" Engines
30 H. P. to 300 H. P.

"C-O" Marine Oil Engines are maintaining the successful performance records they have built up through years of hard service in over one thousand commercial boat installations—fishing craft, tugs, cargo vessels, lighters, ferries, schooners, and workboats of every description.

"C-O" engines—30 H. P. to 300 H. P.—use low grade fuel oils economically.

They have been tried on long and short cruises, on tugs and cargo schooners—they are not only proven to be dependable power producers but they are also flexible and economical. When you see a strong puller and a money maker in any port it's an even chance the power is a Fairbanks-Morse "C-O" oil engine.

Fairbanks, Morse & Co.
MANUFACTURERS CHICAGO

The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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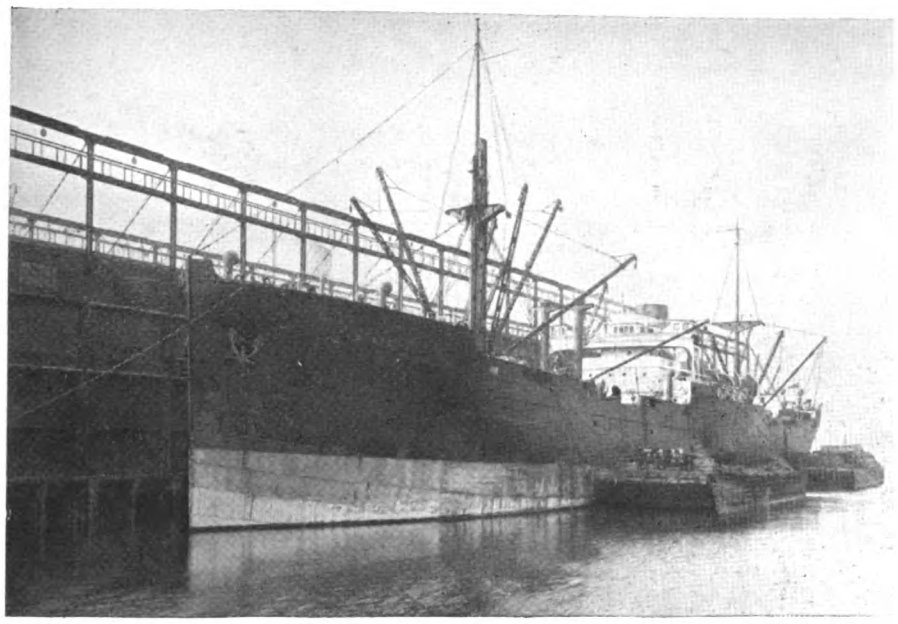
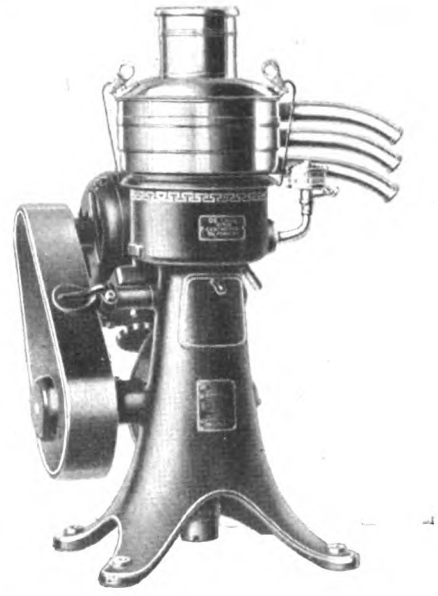


Motorship "La Paz" of the Pacific Steam Navigation Company



De Laval Oil Purifier is saving oil and protecting engines of motorship "La Paz"

The motorship fleet of the Pacific Steam Navigation Company was planned to transport cargo at the lowest possible cost per ton mile. Few, if any, items of design or equipment which contribute to a lower operating cost for the motorship were overlooked.

On each of these motorships, as on many others, a De Laval Oil Purifier has been installed. With this machine, sludge is centrifuged out of the crank-case oil almost as fast as it is formed. As a result bearing wear is greatly reduced and the engines will, without a doubt, give more years of service with less expense for maintenance and overhauling.

By constantly removing impurities from lubricating oil, the De Laval Purifier also effects a great reduction in lubricating costs. The same oil is kept in the system indefinitely, the only replacement being that required to make up for losses by decomposition, evaporation and leakage. No oil need ever be taken out of the system.

No wonder that the Harland & Wolff Shipbuilding Company, builders of the "La Paz" and other vessels of the Pacific Steam Navigation Company's fleet, have in the past two years installed 47 De Laval Purifiers on various vessels building in their yards. The records of other British and American yards also show that De Lavals are now considered as necessary auxiliaries in the engine room of the Diesel or turbine-driven ship.

Mail the coupon for further information regarding ships of either class.

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway Chicago, 29 East Madison St.

Manufacturers' Selling Agents, De Laval Pacific Company, San Francisco, Cal.
Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a

De Laval

Please send Bulletins telling how the operation of ships' engines can be improved and lower lubricating costs obtained, with particular reference to the type of engine checked.

☐ Turbine ☐ Diesel

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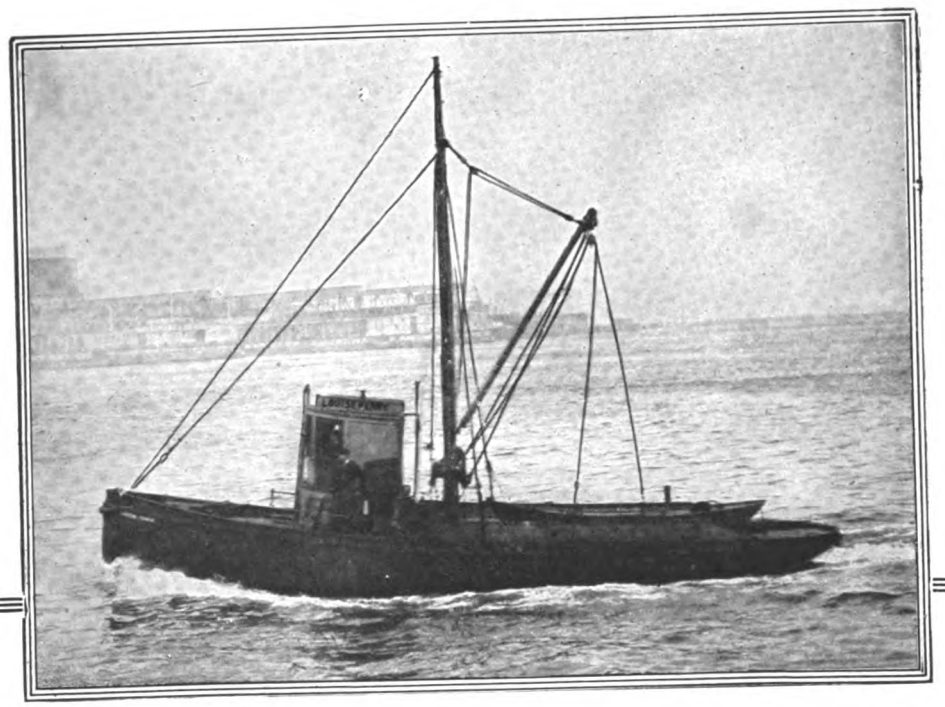

DODGE HEAVY OIL ENGINE

Shows saving of $1.34 per hour on fuel alone

Before the installation of a Dodge engine the clam boat "Louise Perry" made 7 knots per hour and her power plant consumed five and one-half gallons of fuel. Since the 37½ H. P. Dodge engine was installed the speed has been increased to 8 knots and the fuel consumption reduced to 1.9 gallons of low priced fuel oil. The net saving in fuel alone is $1.34 per hour.

This boat is 43 ft. 7 in. long, 5 ft. 4 in. in depth and has a 14 ft. beam. Control is all from pilot house. Speed control is through a quadrant to the governor, and the reverse gear is operated by a handwheel.

Records for fuel economy, low upkeep and reliability of operation made by Dodge engines in many successful installations can be duplicated on your boat.

Write for Complete Information

Dodge Sales and Engineering Company

General Offices: Mishawaka, Ind. Works: Mishawaka, Ind. and Oneida, N.Y.

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M. S. CALIFORNIAN

The first Diesel ship to be fitted with

THE SPERRY GYRO-COMPASS

Sperry Master Gyro-Compass, Top View

The Sperry Gyro-Compass is non-magnetic, points to the true north, and has no variations or deviations.

It has been the Standard Compass in the World's Navies for the last decade, and is now in the service of 25 of the World's largest Steamship Companies.

(Over 1400 in Service)

THE SPERRY GYROSCOPE CO.

MANHATTAN BRIDGE PLAZA

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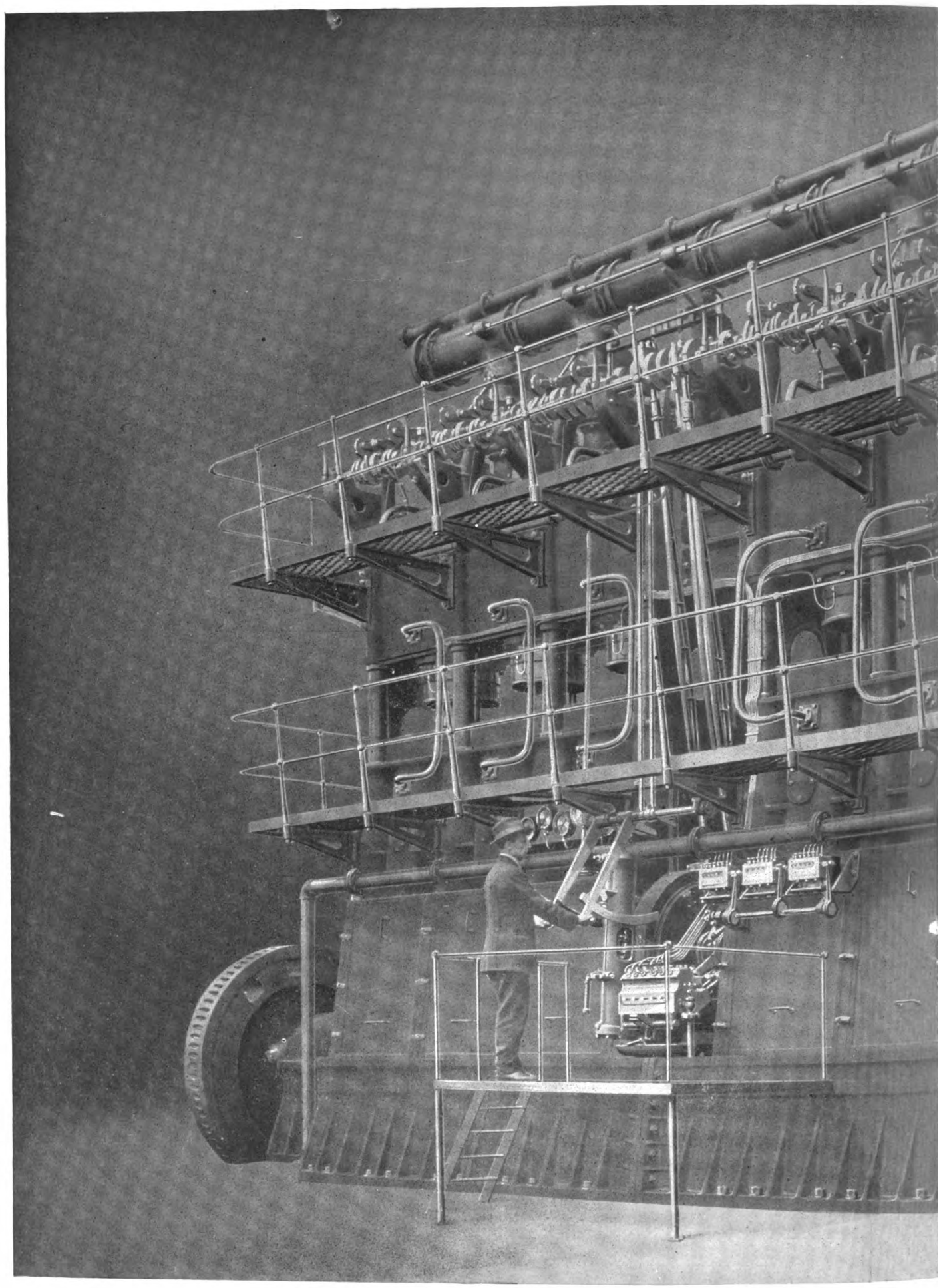

ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INSTA

PACIFIC DIESEL

OAKLAND,

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)IESEL ENGINES

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LED IN THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

ENGINE COMPANY

CALIFORNIA

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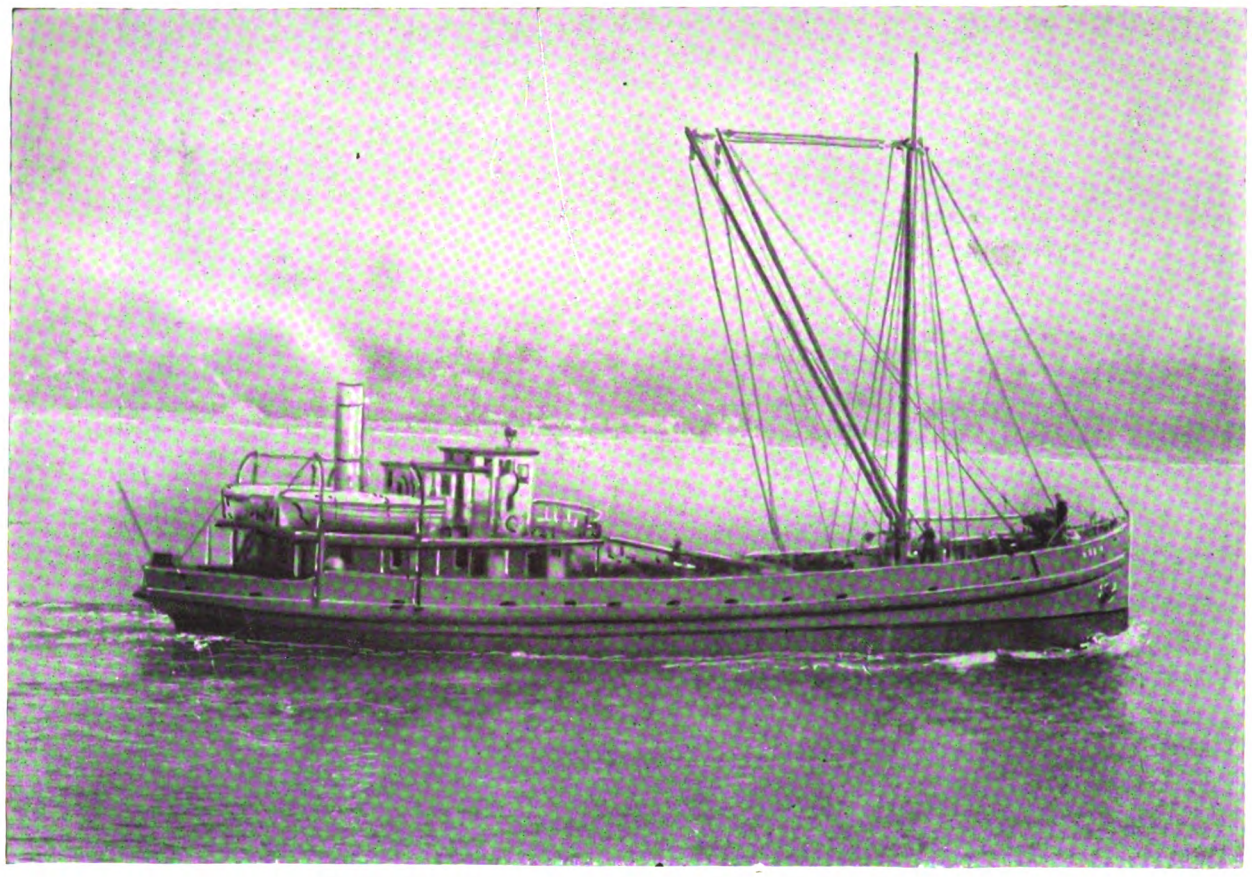
BOLINDERS



M/V "Teco"—1 160 B.H.P. Bolinder Engine, 2 Cylinders

The BRITISH COLUMBIA CEMENT COMPANY, LIMITED, of Victoria, B. C., wrote on March 13th, 1922:

"We are the owners of M.S. 'Teco,' powered with a 160 H.P. BOLINDER engine. This vessel has been running steadily for the past three years and has given remarkable satisfaction in every respect. In fact the M.S. 'Teco,' carrying 6,500 sacks of cement at eight knots, has a fuel bill of only .42 of that of our coal-burning S.S. 'Matsqui,' carrying 4,500 sacks at 6.3 knots."

Let ACTUAL RESULTS ONLY govern your decision regarding power plant.

There is no engine equal to the BOLINDER as power for tugs, small freighters and fishing vessels. Our cooperation during installation and operation will secure entire satisfaction.

BOLINDERS COMPANY, Inc., 30 Church St., New York City

BOLINDERS COMPANY, 411 Exchange Building, 53 State Street, BOSTON, MASS.

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Avenida de Mayo 560
BUENOS AIRES, ARGENTINA

BENJAMIN HAIGH
O'Reilly 26
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CARIB TRADING CO.
CARTAGENA, COLOMBIA

BOLINDER'S COMPANY · J K G · TRADE MARK · NEW YORK U.S.A.

FIDANQUE BROS. & SONS
PANAMA, REP. OF PANAMA

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Marine Building
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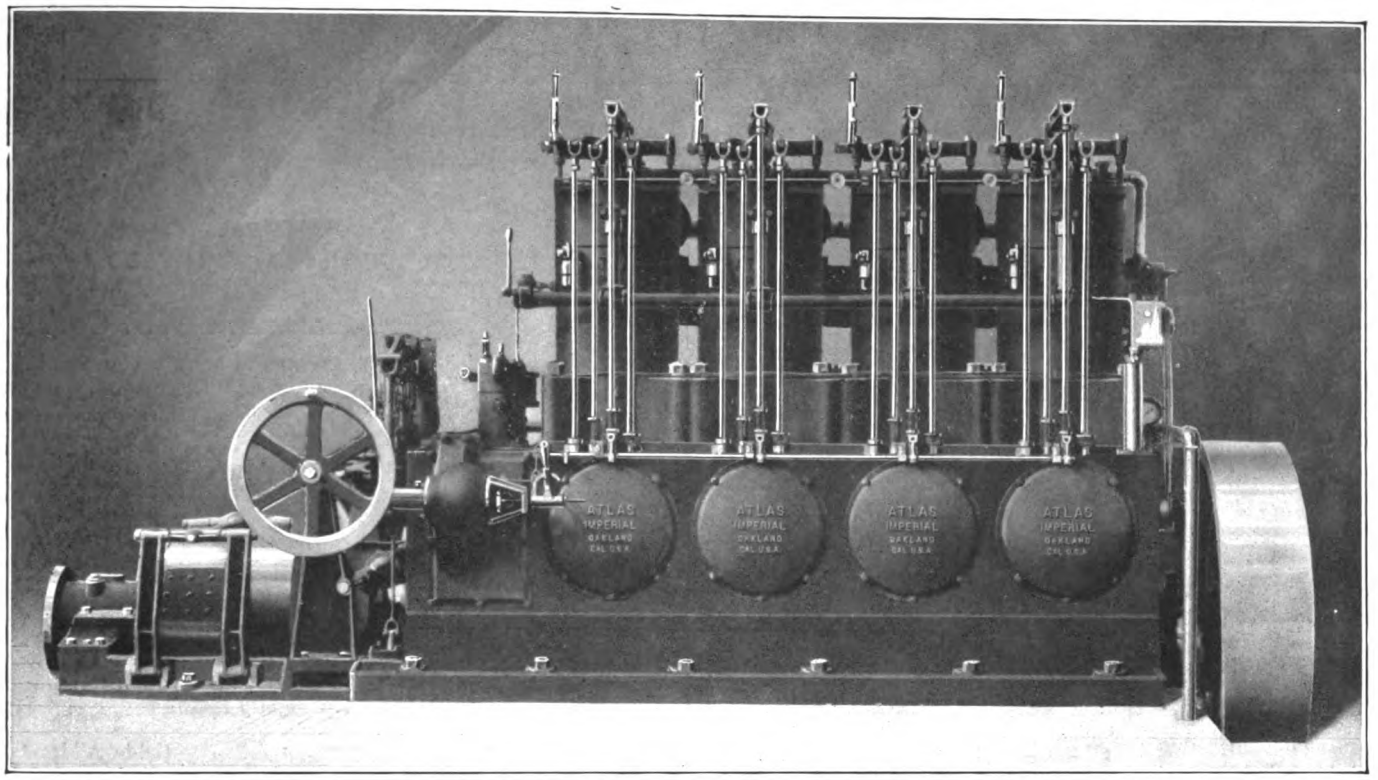

165 H. P. MECHANICAL-INJECTION MARINE DIESEL-ENGINE
BUILT IN 3, 4 and 6 CYLINDER TYPES 55 TO 500 HORSE-POWER

SOME CHARACTERISTICS OF OUR ENGINES:

STARTING:	Is accomplished by compressed-air at 30 to 150 lbs. pressure in 5 to 10 seconds from stone cold to full power.
FUEL INJECTION:	Fuel-oil is injected into the combustion-chamber by mechanical means, no high-pressure air is used.
FUEL IGNITION:	Ignition is accomplished by the heat of compression only, no hot-balls, points, or surfaces of any kind are used.
COMPRESSION:	350 lbs. per square-inch.
FUEL CONSUMPTION:	One gallon of crude-oil for 19 horsepower per hour.
GRADE OF FUEL:	Any grade of fuel-oil is used that will flow readily through the pipes to the engine.
COST OF FUEL:	About 1/10 of a gas-engine.
LUBRICATION:	Return force-feed system to bearings through hollow crank-shaft and connecting-rod. Mechanical feed to cylinders. Consumption 1/10 gallon per 100 H. P. hour.
POWER:	Engines develop 20% in excess of rated power.
GOVERNING:	Gear-driven fly-ball governors regulate the quantity of fuel used, and sensitively controls the speed of the engine from no-load to full-load and vice versa with a variation in speed of not over 5%.
VIBRATION:	Less than a heavy-duty gas-engine.
RELIABILITY:	Absolutely dependable under the most trying conditions.
FLOOR SPACE:	About 15% greater than a heavy-duty gas-engine of same power.
WEIGHT:	Slightly greater than heavy-duty gas-engines of same power.
ACCESSIBILITY:	All parts are easy of access and made interchangeable as far as practical.
MATERIAL & WORKMANSHIP:	Are the highest possible standard for commercial purposes. All parts made from carefully selected material with a view of its special service, carefully machined to jigs and templates and ground and hardened where necessary.
SPEED:	Revolutions can be varied from 80 to 350 per minute.
SALES:	Our sales are rapidly increasing and every engine is giving wonderful service and satisfaction.
INSTALLATIONS:	3800 H. P. in 27 units now working. 2500 H. P. in 20 units now on order.

* *

Our Diesel engine in your boat will please you and make you money.

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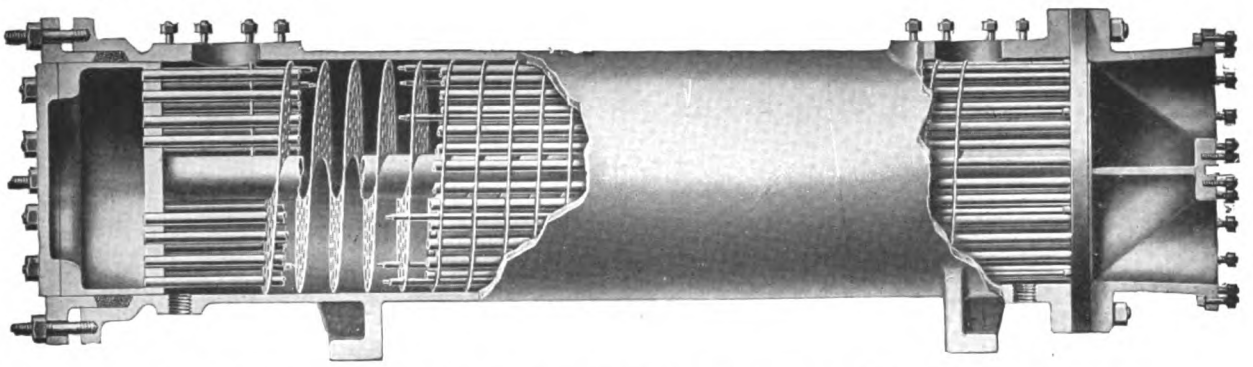

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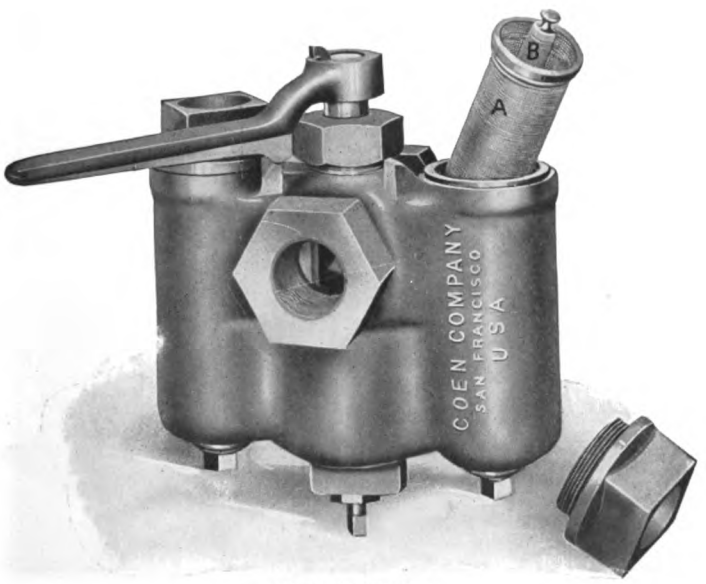

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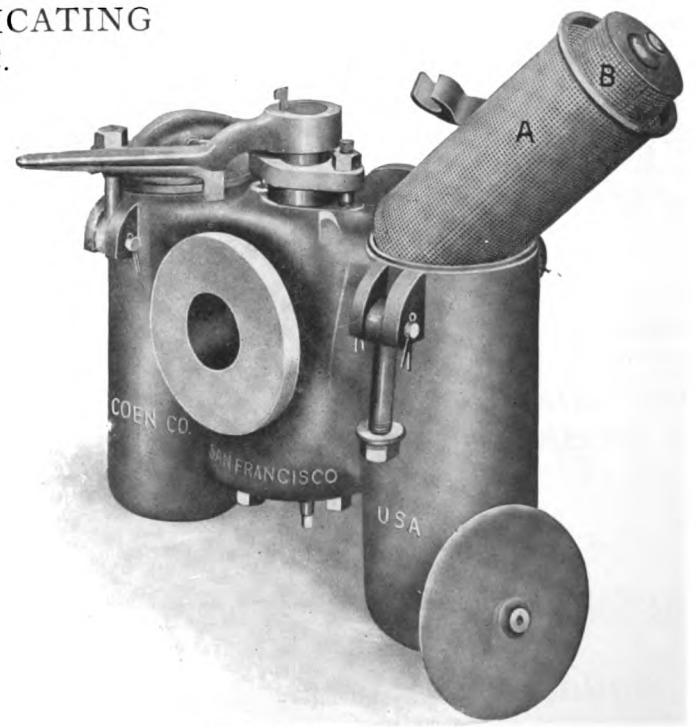

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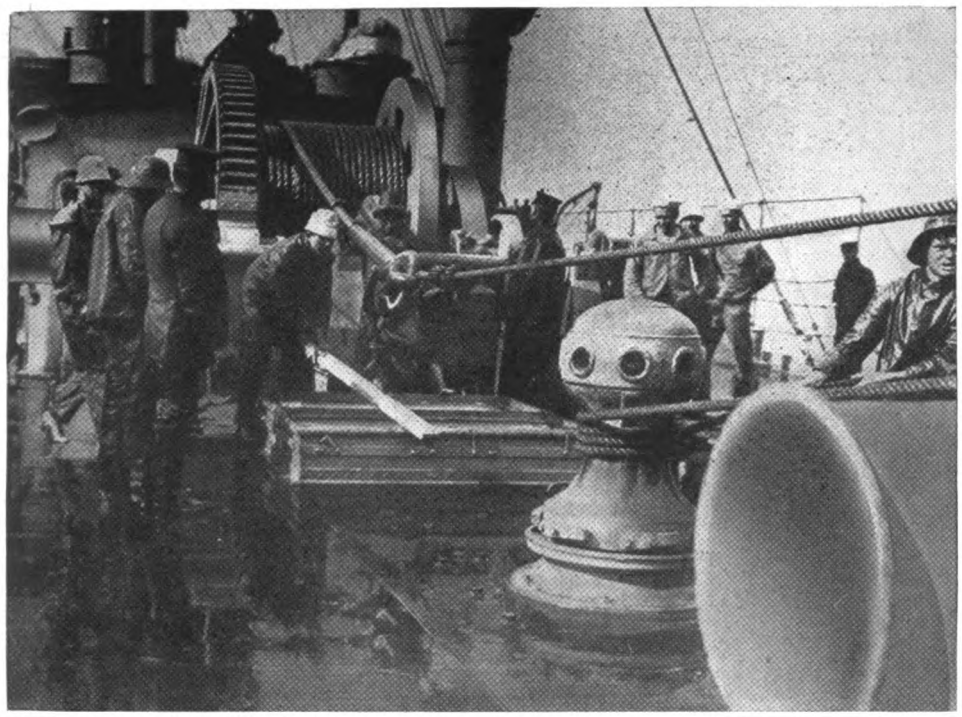

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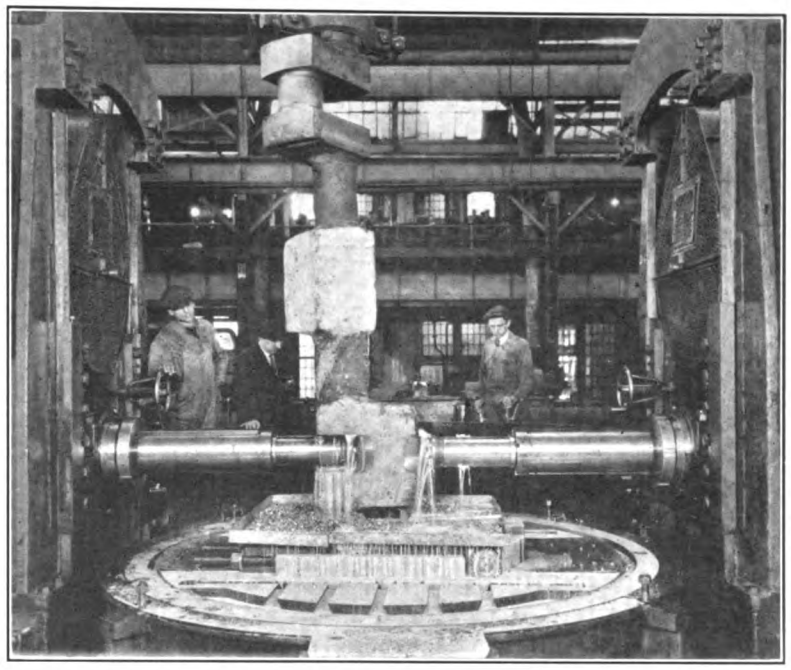

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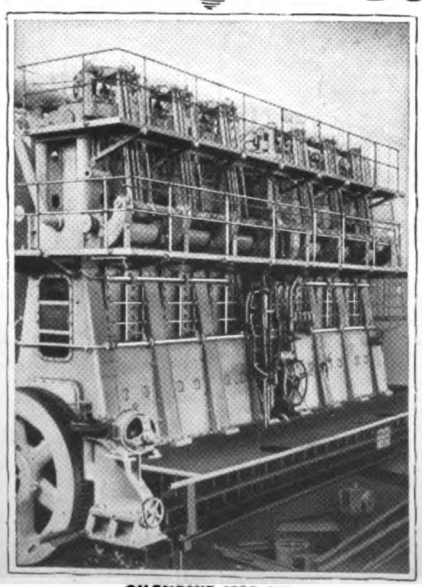

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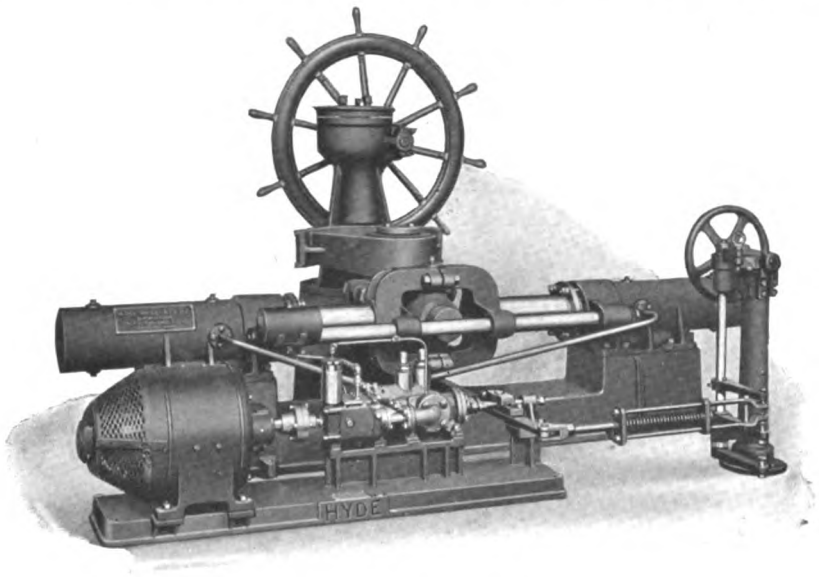

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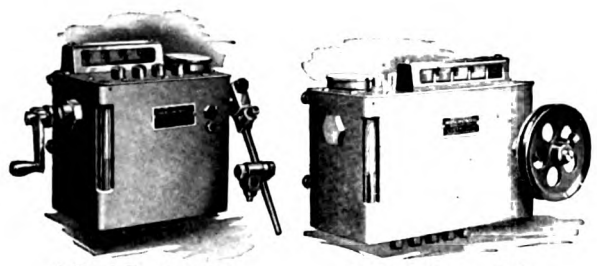

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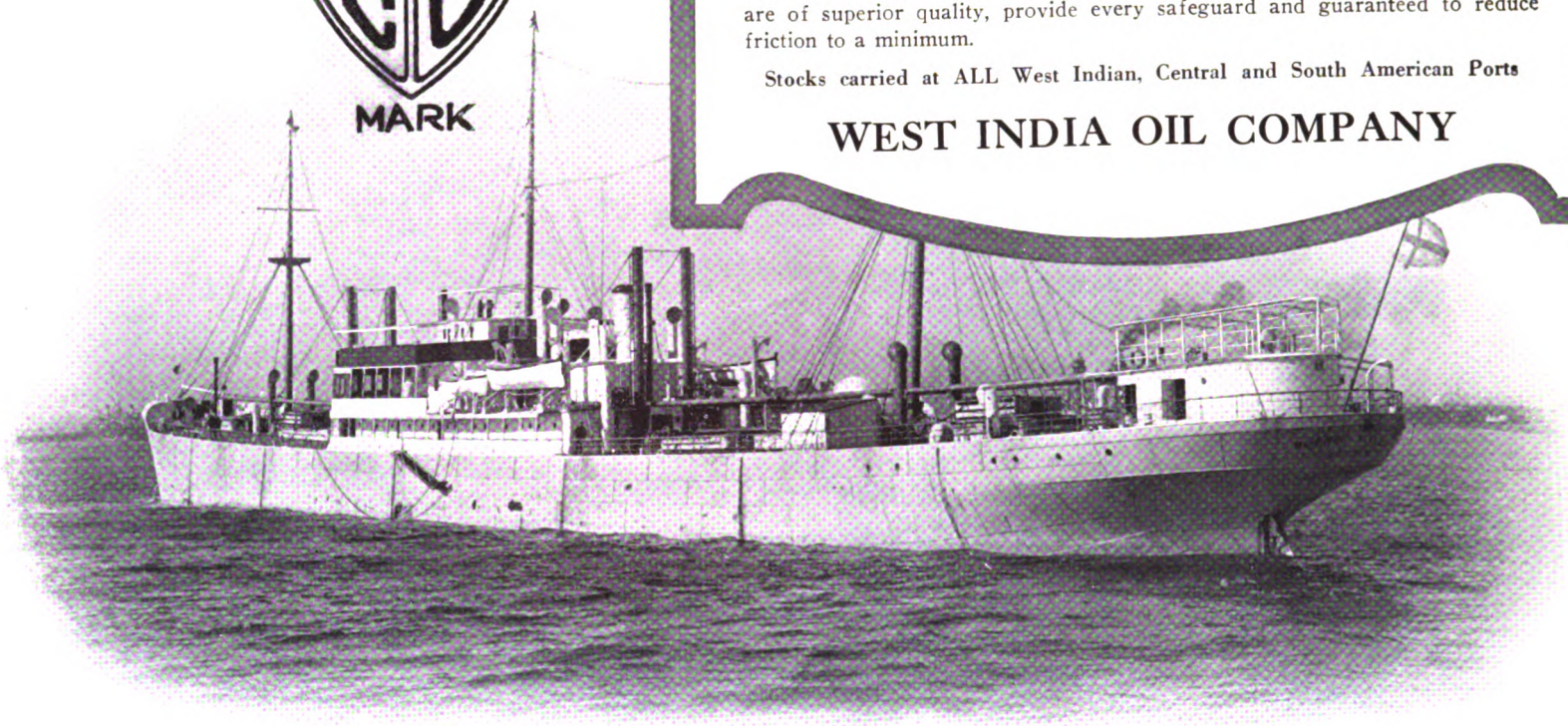

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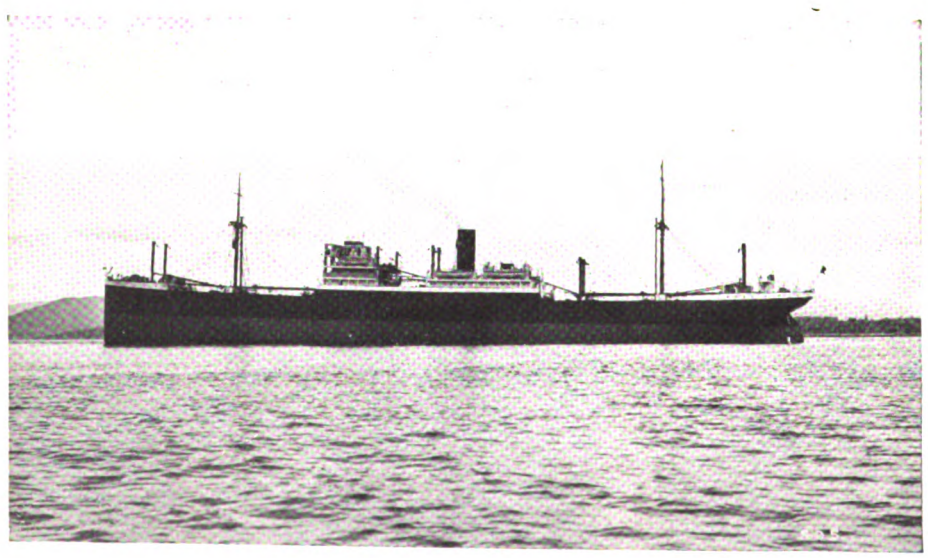

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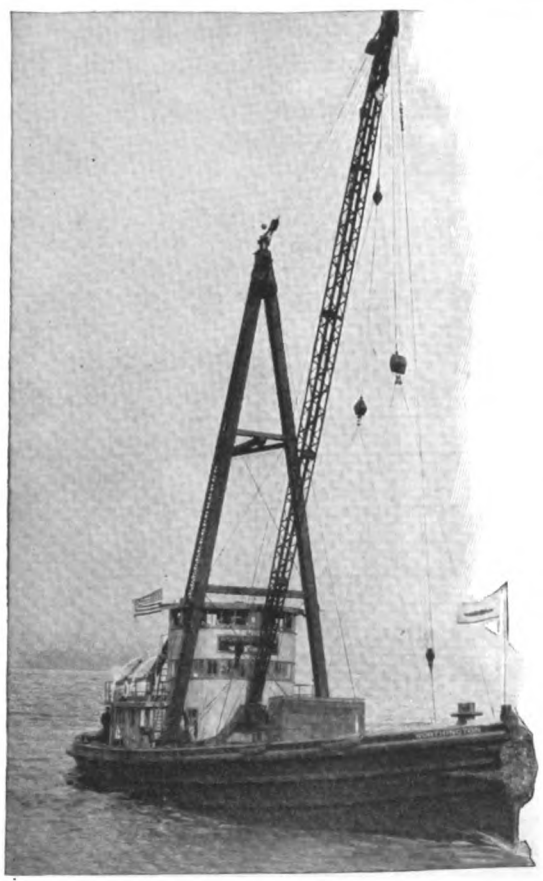

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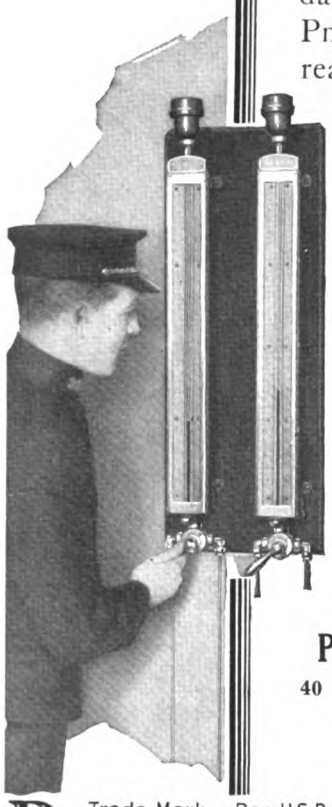

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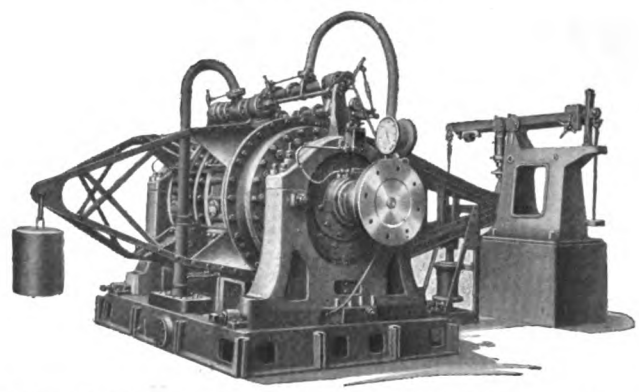

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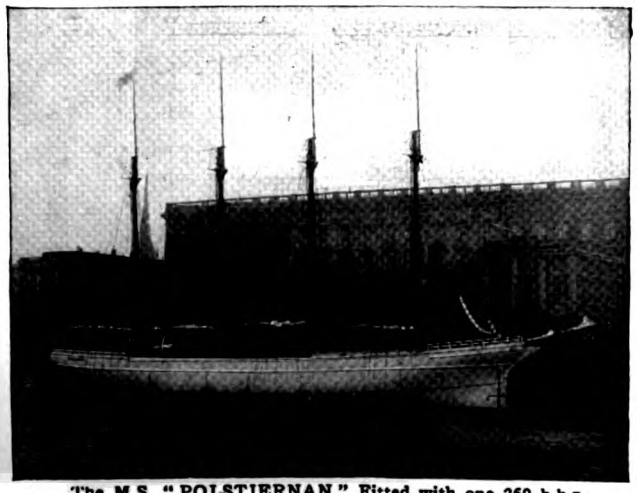

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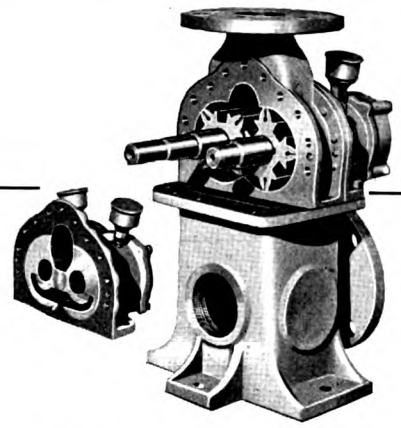

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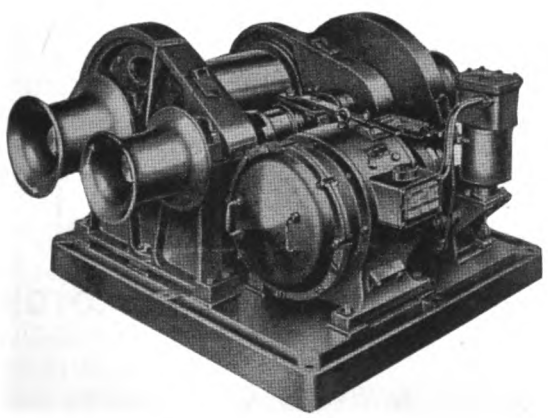

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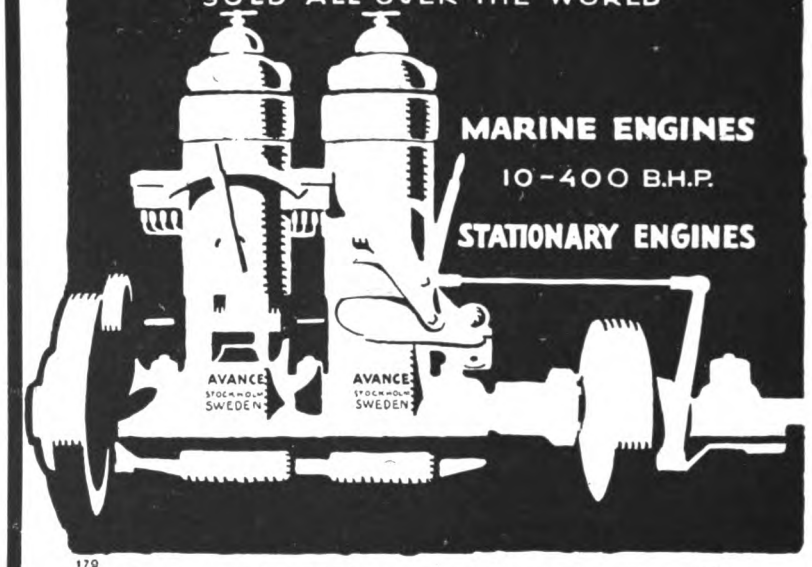

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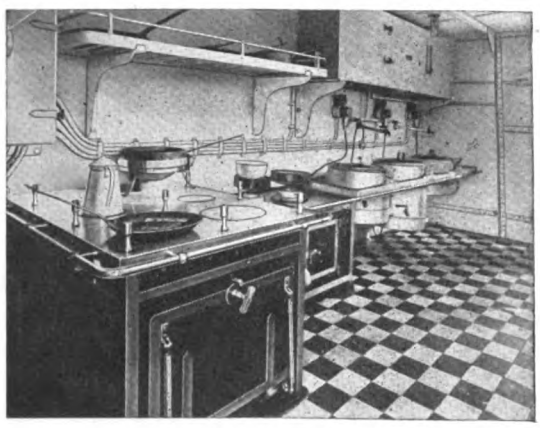

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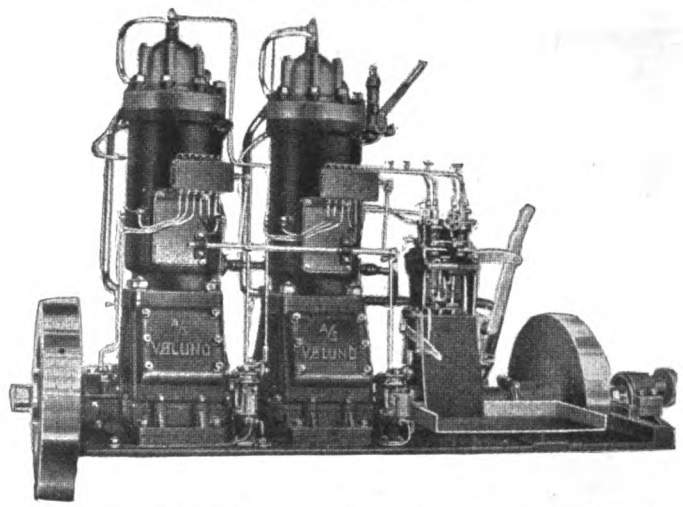

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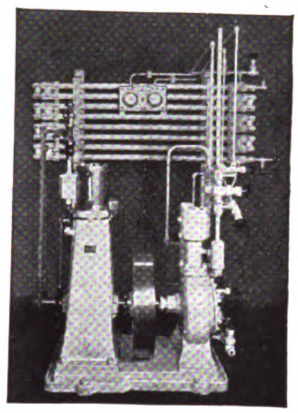

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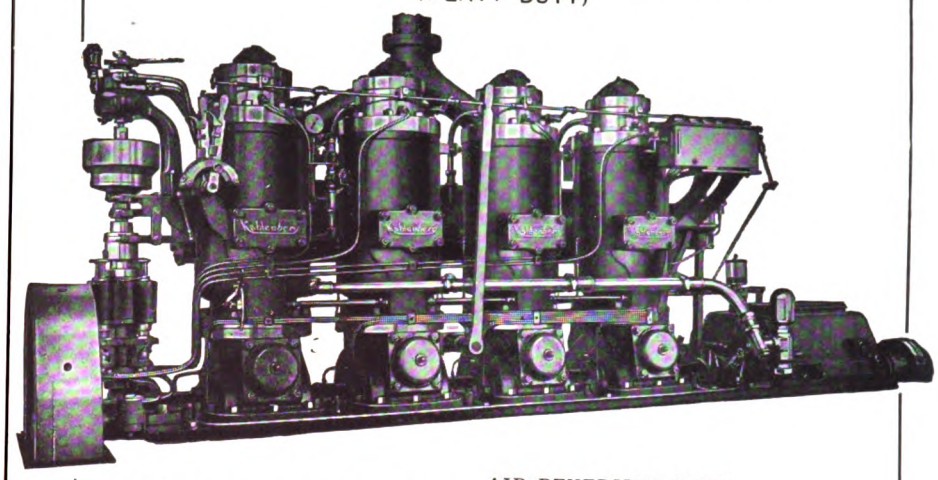

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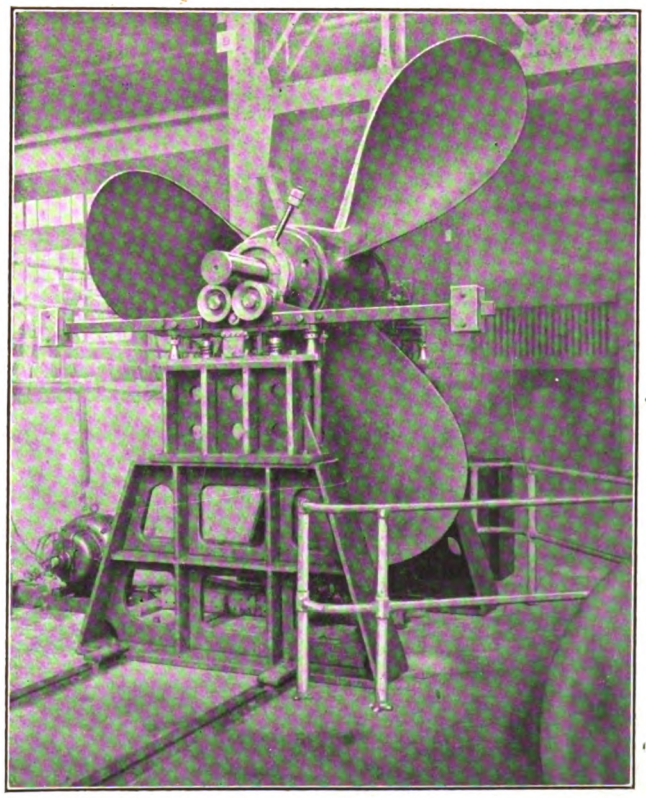

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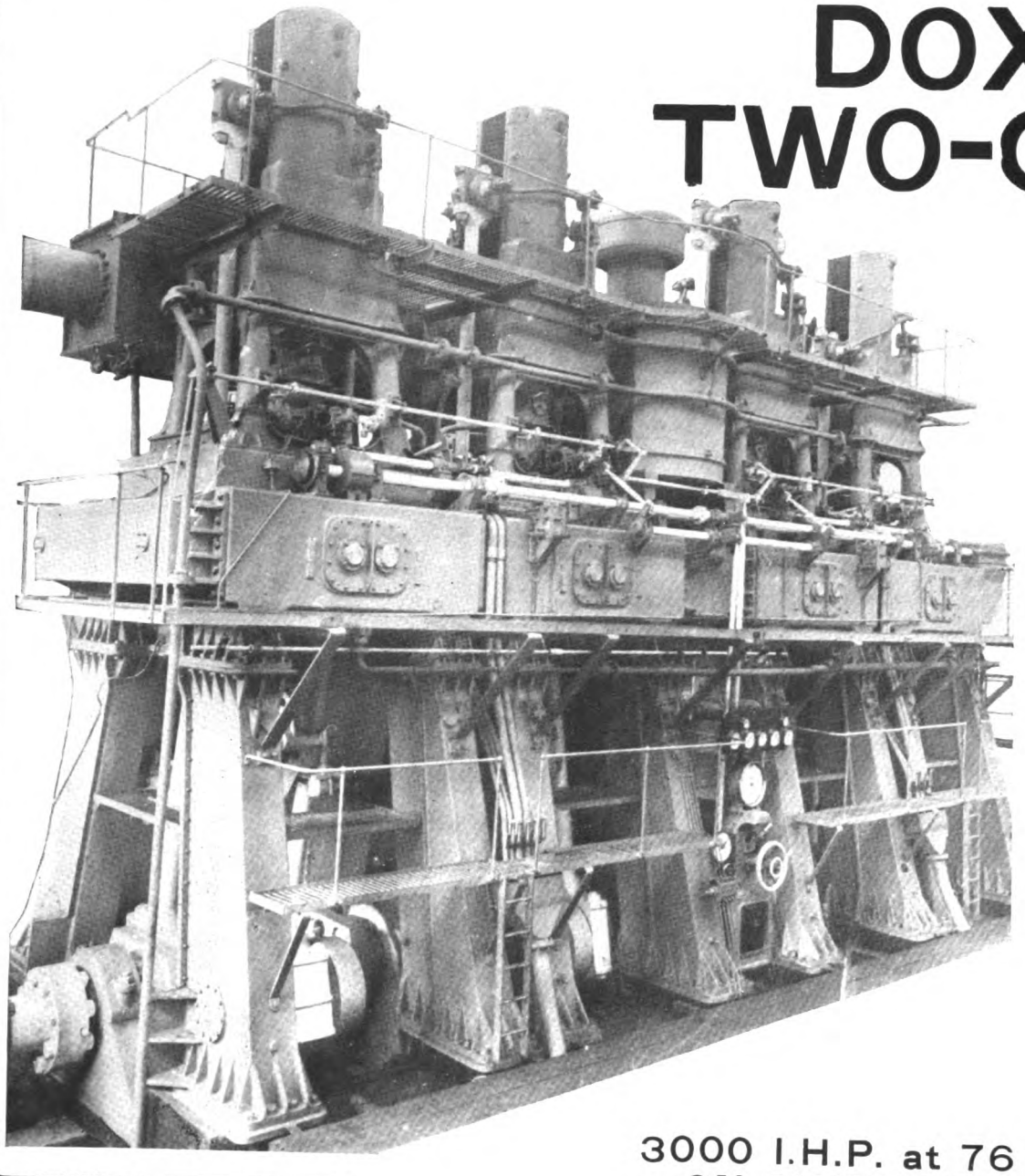

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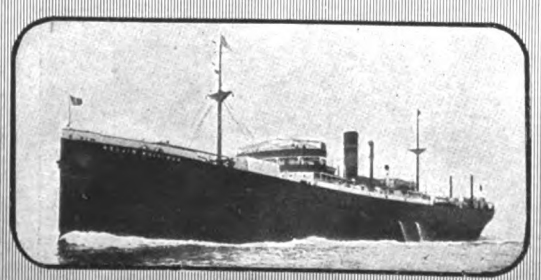

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BORRIKA	4400
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TEXACO No. 146	1000
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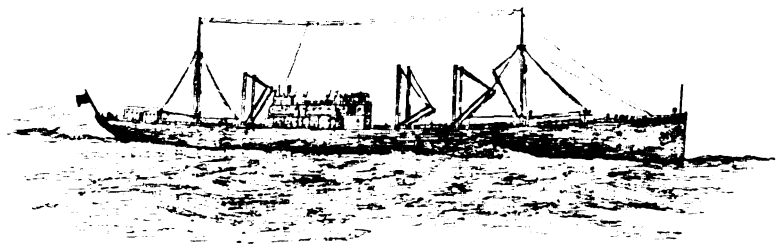

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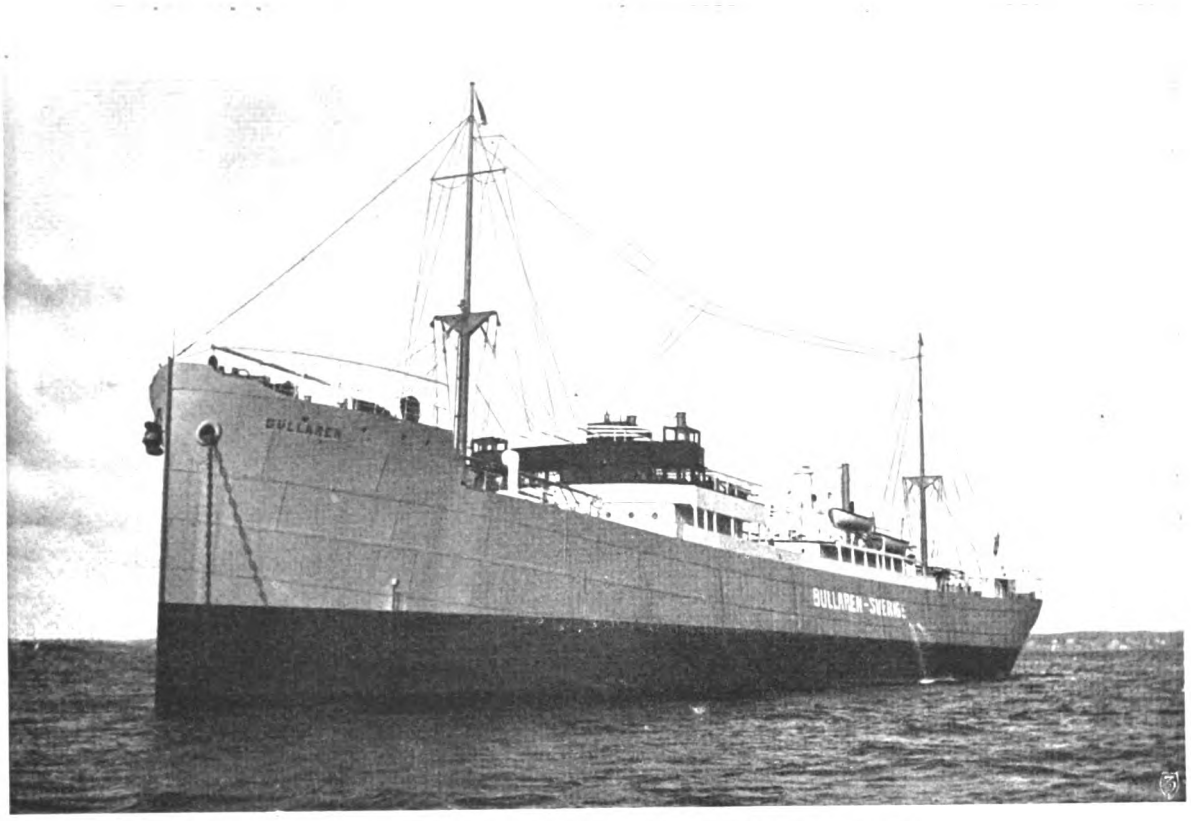

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9,400 tons d. w.; Owners: Transatlantic Steamship Company, Göteborg

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Average speed	12,5 Knots
Daily fuel-consumption incl. auxiliaries	13,7 Tons
Power	4,000 I. H. P.
Cruising-radius	30,000 Naut. miles

REMARKS:

The M. S. Bullaren has covered a total distance representing 10 trips around the world and her Diesel-motors have made about 100,000,000 revolutions

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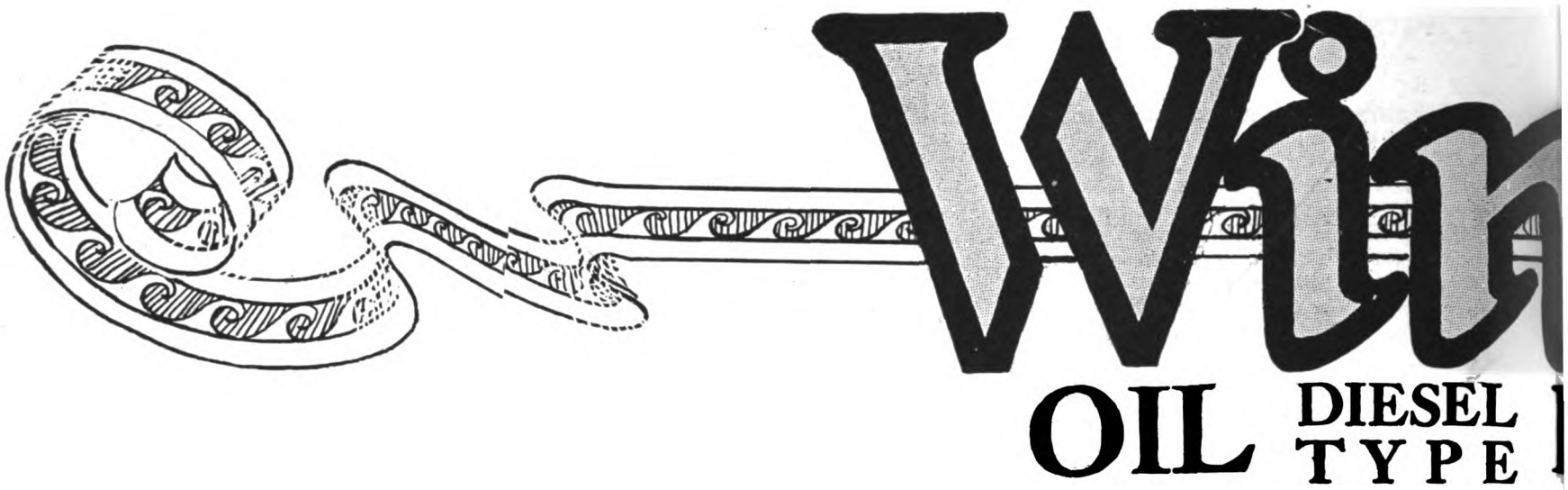
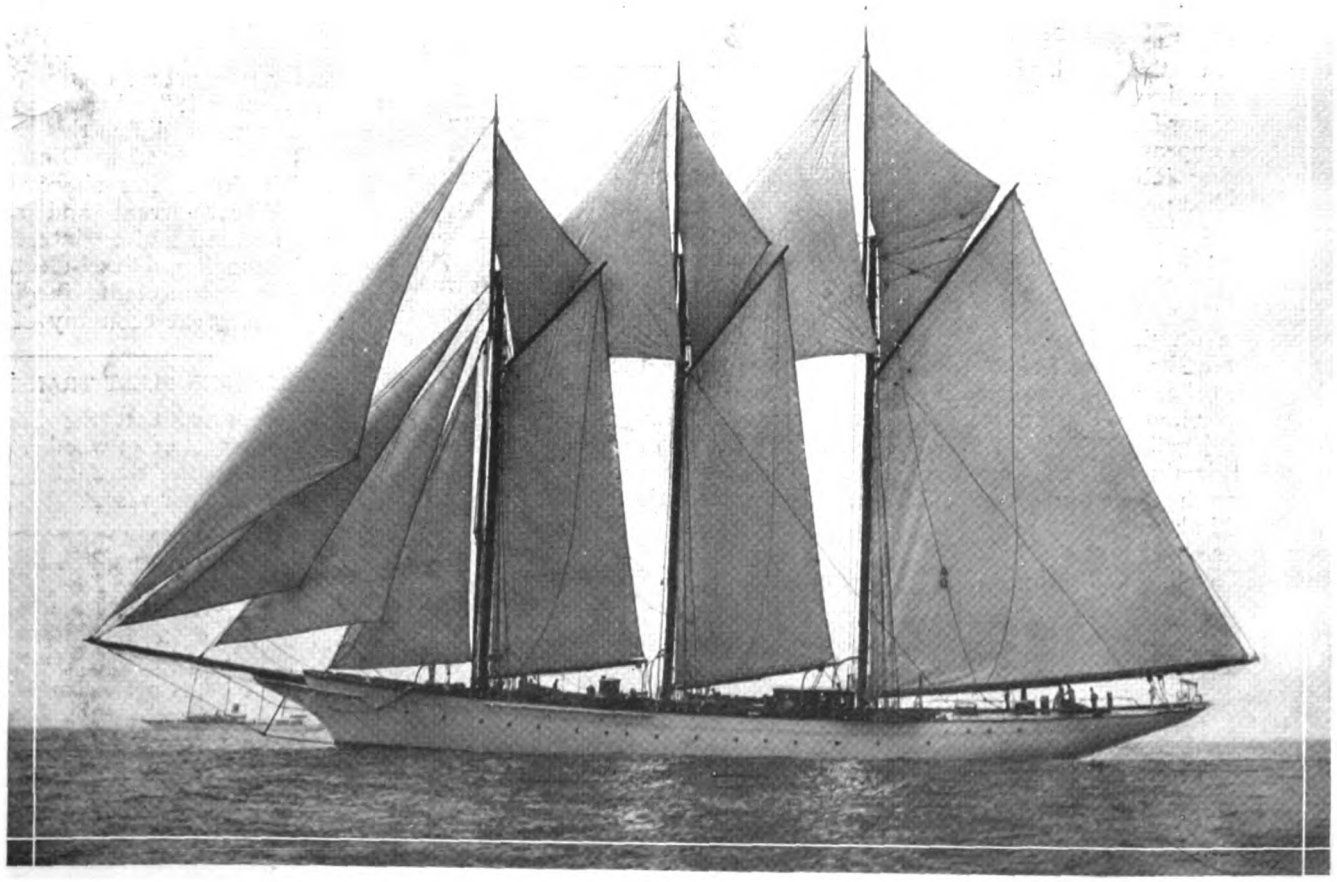


"ALCYONE"—A Diesel-Electric Yacht

"Alcyone" built in 1908 by Geo. Lawley & Son Corp. from designs by Tams & King and owned by Mr. H. W. Putnam, has recently been converted from a Steam Yacht to a Diesel-Electric Yacht at the yards of the Tebo Yacht Basin.

The new power plant consists of two Winton Diesel Oil Engines, 6 Cylinder 11"x14" developing 225 H.P. at 260 R.P.M., each engine direct connected to a 140 K.W. Westinghouse Generator and a 12 K.W. Exciter, which in turn supply power to a 350 H.P. Westinghouse Driving Motor operating at 175 R.P.M. Two auxiliary Winton Generating Sets are operated by six cylinder 3"x4" Winton kerosene motors. Speed with steam plant—10 knots. Speed with Diesel-Electric Drive—11 knots.

Another striking example of the general trend towards Diesel-Electric Drive. Here is a 600 ton yacht in which the speed has been increased, cruising capacity tremendously added to, power plant space reduced, operating expenses minimized and vibration eliminated.



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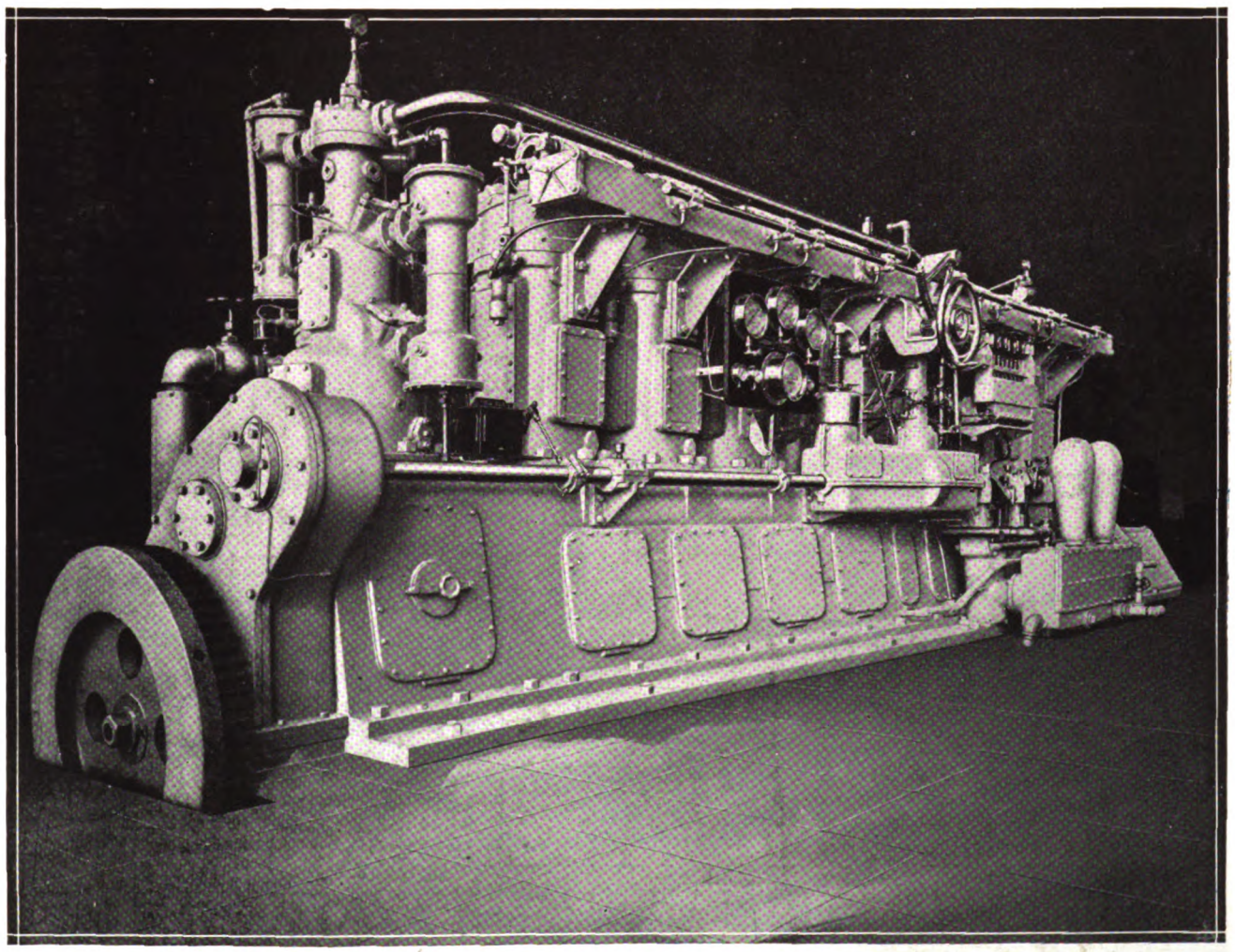

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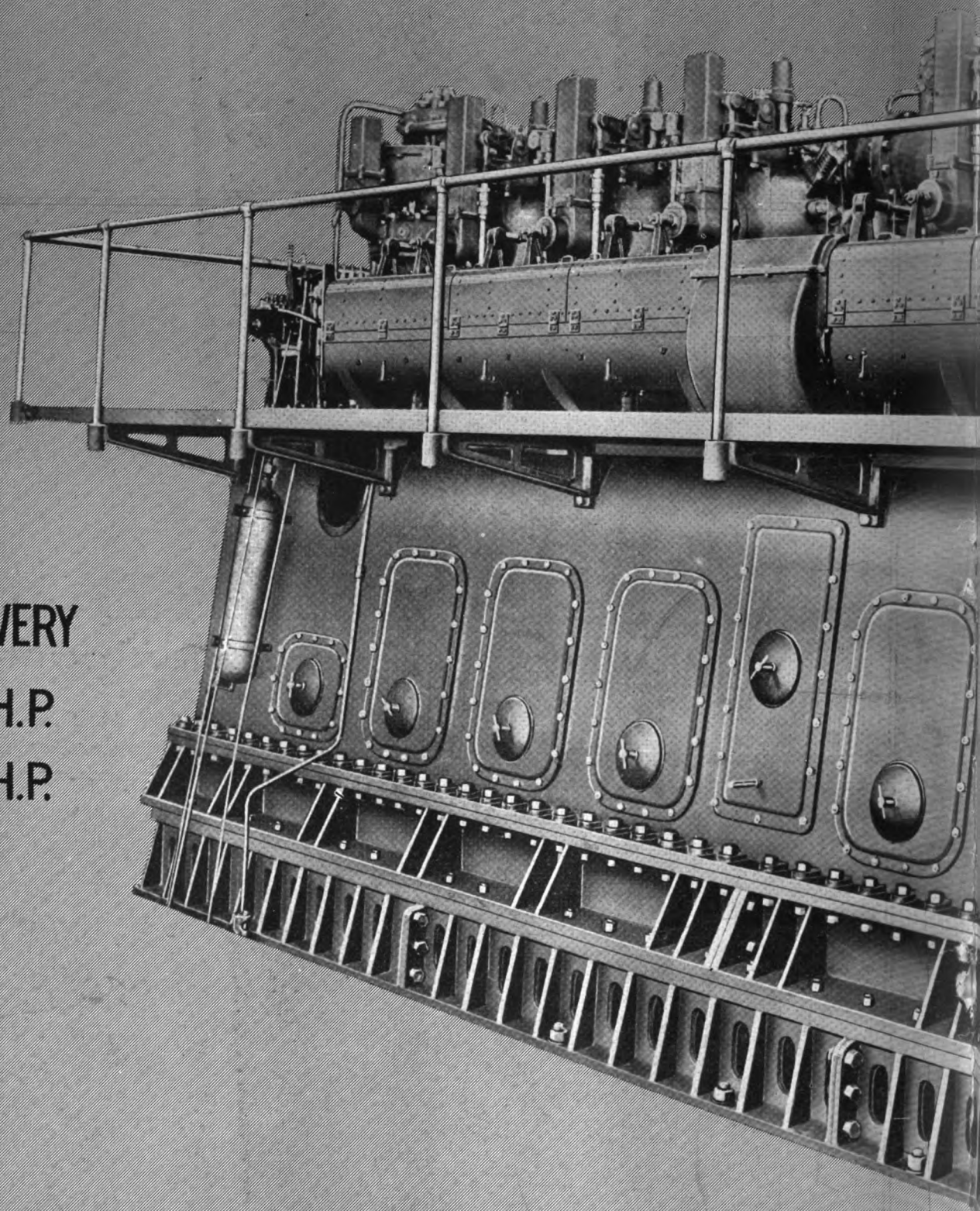
NELSECO DIESEL ENGIN



SIZES
FOR EARLY DELIVERY
120 H.P., 180 H.P.
240 H.P., 360 H.P.
480 H.P.

600-750 B.H.P., 225 R.P.M., 4 cycle, 6 cylinders
HEAVY-DUTY MARINE OR STATIONARY DIESEL ENGINE

NELSECO

New London Ship
Groton,

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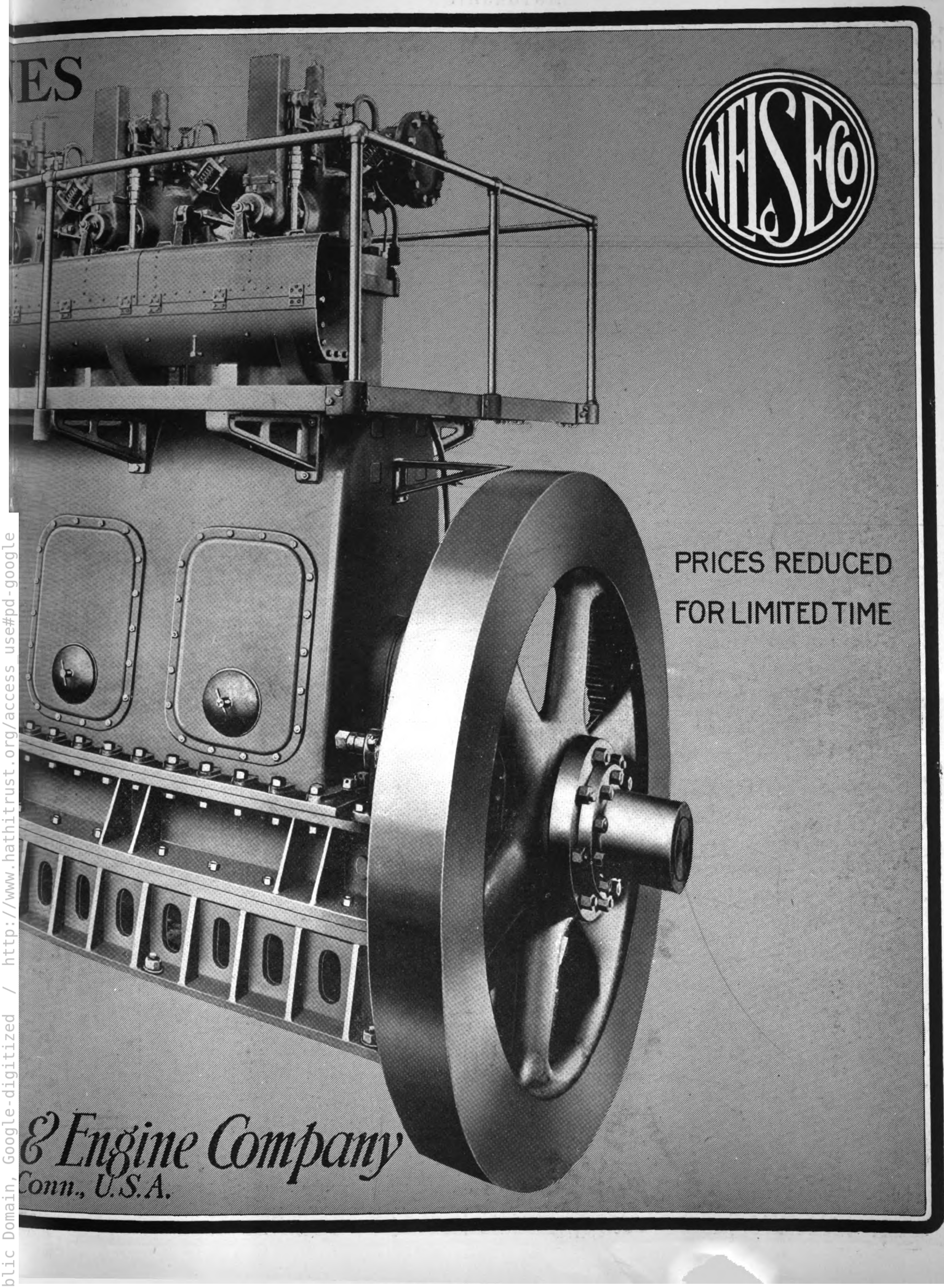

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Some WERKSPOOR ENGINED MOTORSHIPS

M.S. "Juno"

M.S. "Lara"
M.S. "Hestia"

M.S. "Jules Henry"

M.S. "Salerno"

M.S. "Vulcanus"

M.S. "Sardinia"

M.S. "San Paulo"

M.S. "Artemis"

BOELONGAN NEDERLAND

M.S. "Boelongan"
M.S. "Bengkalis"

M.S. "Sebastian"

M.S. "Hermes"
M.S. "Selene"

M.S. "Sembilan"

M.S. "Tosca"

SIBERG-NEDERLAND

M.S. "Myer"
M.S. "Siberg"

M.S. "Loudon"

M.S. "Ares"

M.S. "San Miguel"

M.S. "Emanuel Nobel"
M.S. "Elbruz"

M.S. "Athene"

M.S. "Geisha"

1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800

FOUR-CYCLE DIESEL ENGINES

WERKSPOOR

AMSTERDAM - - HOLLAND

U. S. Representative:
WM. BRAAT
901 Woolworth Bldg., N. Y. City

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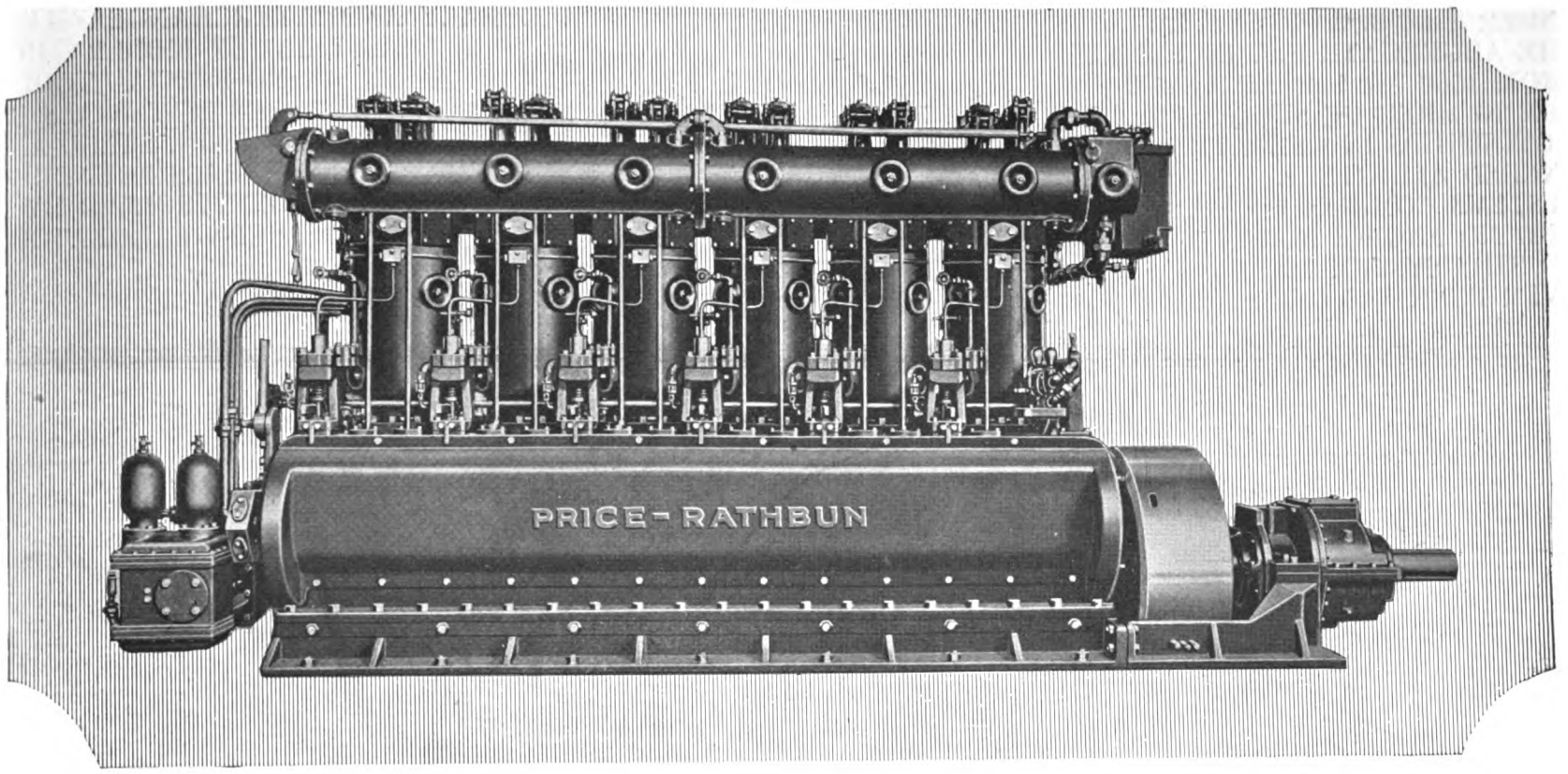

The Advantages of Oil Engine-Electric Drive

for ship propulsion can be fully realized only when the electrical equipment is combined with oil engines possessing the *simplicity* and *high fuel economy* of the

PRICE-RATHBUN ENGINE

A line of sizes ranging from 240 to 750 BHP has been developed which gives the ship operator a wide choice in number and size of engine generator sets. These engines

Are designed for marine installation.

Have six cylinders.

Use the Price system of direct injection of fuel, eliminating the high pressure injection air compressor and thereby reducing the weight and floor space of installation.

Have automatic pressure system of lubrication.

Have a simple yet sensitive governor control which automatically proportions the fuel change to meet load fluctuations, maintaining the constant speed essential for correct operation of electric generators and motors.

Have moderate weight per horse-power making it possible for total weight of installation to be no greater than for a direct drive installation.

Our engineers will be glad to go into full details with you with reference to marine oil engine electric drive.

INGERSOLL-RAND COMPANY, 11 Broadway, New York

PRICE-RATHBUN Engines are also built for direct drive in sizes from 220 to 750 BHP.

19-MOE

Ingersoll-Rand

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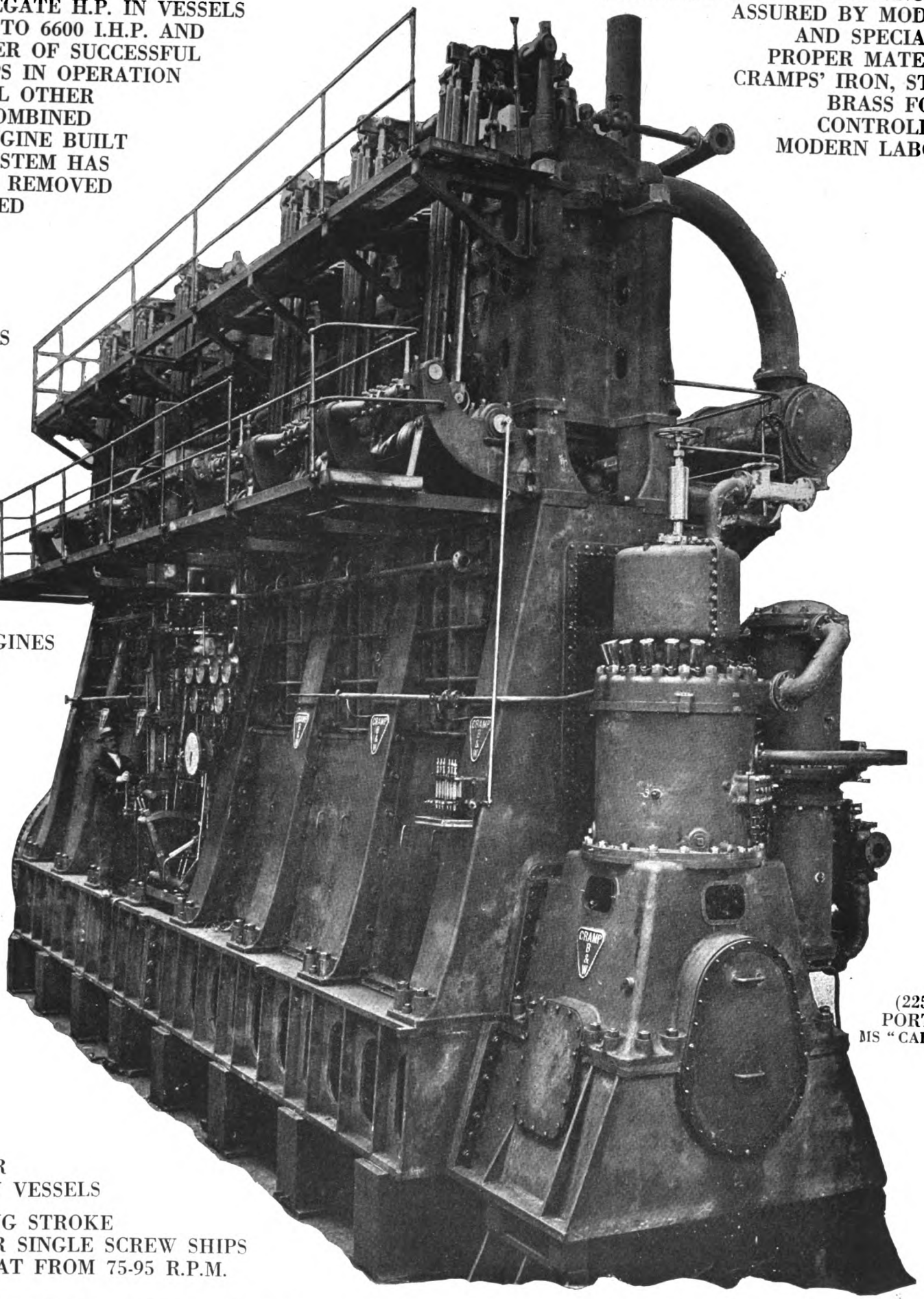
UNDER THE B. & W. SYSTEM THE AGGREGATE H.P. IN VESSELS FROM 1500 TO 6600 I.H.P. AND THE NUMBER OF SUCCESSFUL MOTORSHIPS IN OPERATION EXCEED ALL OTHER SYSTEMS COMBINED AND NO ENGINE BUILT TO THIS SYSTEM HAS EVER BEEN REMOVED OR REPLACED

ACCURACY AND INTERCHANGEABILITY ASSURED BY MODERN JIGS AND SPECIAL TOOLS; PROPER MATERIALS BY CRAMPS' IRON, STEEL AND BRASS FOUNDRIES CONTROLLED BY A MODERN LABORATORY

MOTORSHIPS THAT STAY ON THE SEAS

DIESEL ENGINES THAT STAY IN THE SHIPS



(2250 I.H.P.)
PORT ENGINE
MS "CALIFORNIAN"

STANDARD ENGINES FOR TWIN SCREW VESSELS

SPECIAL LONG STROKE ENGINES FOR SINGLE SCREW SHIPS OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE
(Burmeister & Wain System)

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From Trawler to Battleship

—Modern Propulsion

The General Electric Company is a pioneer in the development of modern ship propulsion. G-E equipments are renowned for reliability, and successful installations are numbered in hundreds.

Visit these ships; inspect their propelling machinery; and investigate their performance. Then be sure *your* ship power is backed by broad experience.

G-E engineers are eminently fitted to recommend and design the ideal drive for any vessel—from trawlers and ferries to the largest battleship. Why not submit your problem?

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

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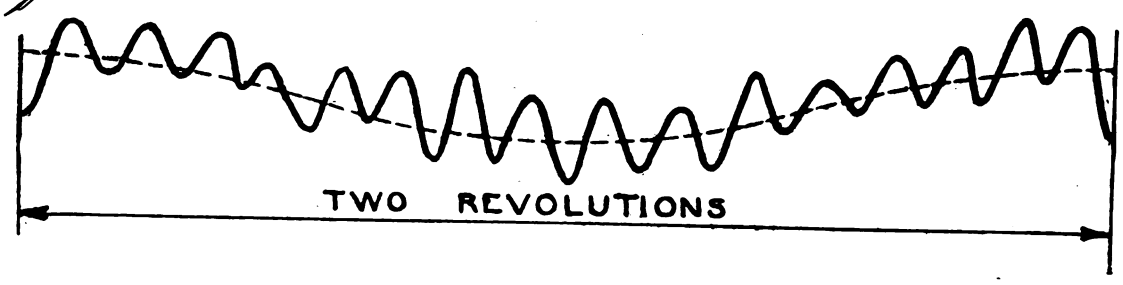
TORSIOGRAMS



Torsiogram from the crankshaft of an eight cylinder in line engine. This interesting curve was obtained on a recent investigation of the torsional vibration characteristics of a four-cycle, eight-cylinder engine. Note the pronounced vibrations set up by the 16th harmonic component of the explosive forces and particularly that there are sixteen reversals of stress during each revolution.

Do you know why this installation is a failure?

Do you know how to compute the true critical speed from the above curve?

Do you know that destructive stresses may be set up while running at speeds far below the critical?

Do you know how to avoid these dangers and that all of these troubles can be prevented by proper designing before the engine is built?

We have experts to investigate and report on torsional as well as all other types of vibrations.

Send for interesting booklet

"ELIMINATING VIBRATIONS"

We also manufacture NWA Static and Dynamic Balancing Machines in sizes for handling all kinds of rotors, weighing from 10 pounds up to 200,000 pounds. Five years of unbroken success, with every purchaser a booster.

VIBRATION SPECIALTY COMPANY

N. W. AKIMOFF, President

Offices: Harrison Building

Laboratories: 1532-34 Winter Street

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Double Dredging Capacity

Watch an electric dredge work and you will find that it will load a barge or bunker in half the time taken by a steam dredge.

On board an electric dredge you will be agreeably surprised by the convenient arrangement of machinery and the free space available.

A Diesel engine driven generator supplies the current to the motors which, individually, drive all machinery, including the propeller. Motor drive allows the barge machinery to be placed just as desired for the best operation.

The control can be located at any desirable point.

No boilers—no coal bunkers—no heavy reciprocating engines.

Fuel consumption reduced to one half or less—capacity practically doubled.

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East Pittsburgh, Pa.
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Westinghouse

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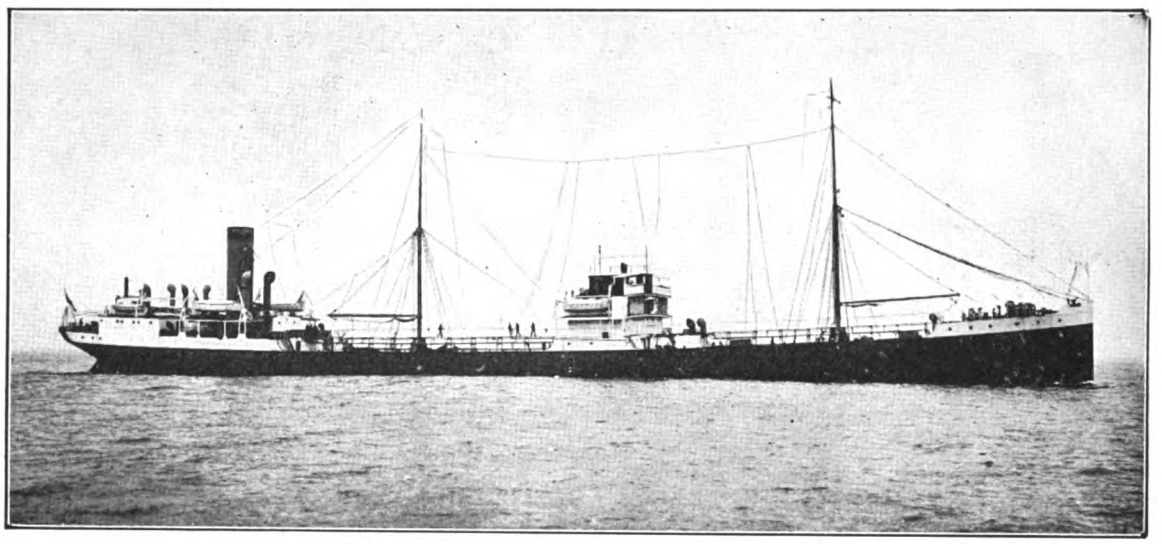
THE FUEL OF THE 20th CENTURY

Efficiency *Economy* *Cleanliness*



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Batavia
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Bombay
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BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N.Y., U.S.A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

THE Asiatic Petroleum Company also supply **Kerosene Oil** for use in the smaller Internal-combustion Engines and are prepared to supply **Petroleum Spirits, Lubricating Oils, Wax** and **Greases** in all Far Eastern Markets.

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FALK
HERRINGBONE GEARS

The Diesel-powered ship industry has long recognized the practical superiority of Falk Herringbone Reduction Gears.

This type of power transmission has proved particularly adaptable and highly efficient in Motorships because of its ability to deliver a smooth, continuous flow of power devoid of back-lash and minus the irregularities which mark the more common types of gears.

For rehabilitation work, as well as new installations, Falk Herringbone Gear Units are recommended by leading marine engineers.

Our engineering department will be glad to furnish you with such general or specific information as you may desire.

THE FALK CORPORATION

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M. P. Fillingham, 50 Church St., New York City.
F. W. Grimwood, Rialto Bldg., San Francisco, Cal.
Vulcan Iron Works, Wilkes-Barre, Pa.
Denver Engineering Works, Denver, Colo.

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Montreal, Quebec, Canada.

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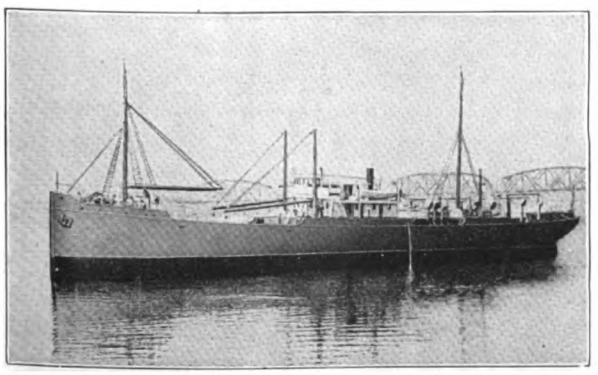
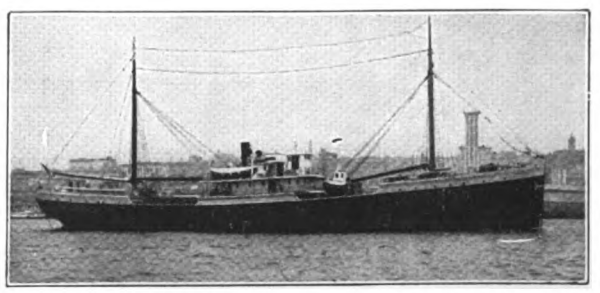


The "James Timson," another of the Diesel-driven freighters with Falk Herringbone Gears



"Libby Maine," full powered twin-screw freighter equipped with Falk Reduction Gears. This ship is driven by twin-Dow Diesel Engines, 320 S. H. P. each at 420 R. P. M., propellers at 100 R. P. M. Made 63,185 nautical miles in 2½ years. Gears in perfect condition

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WERKSPOOR

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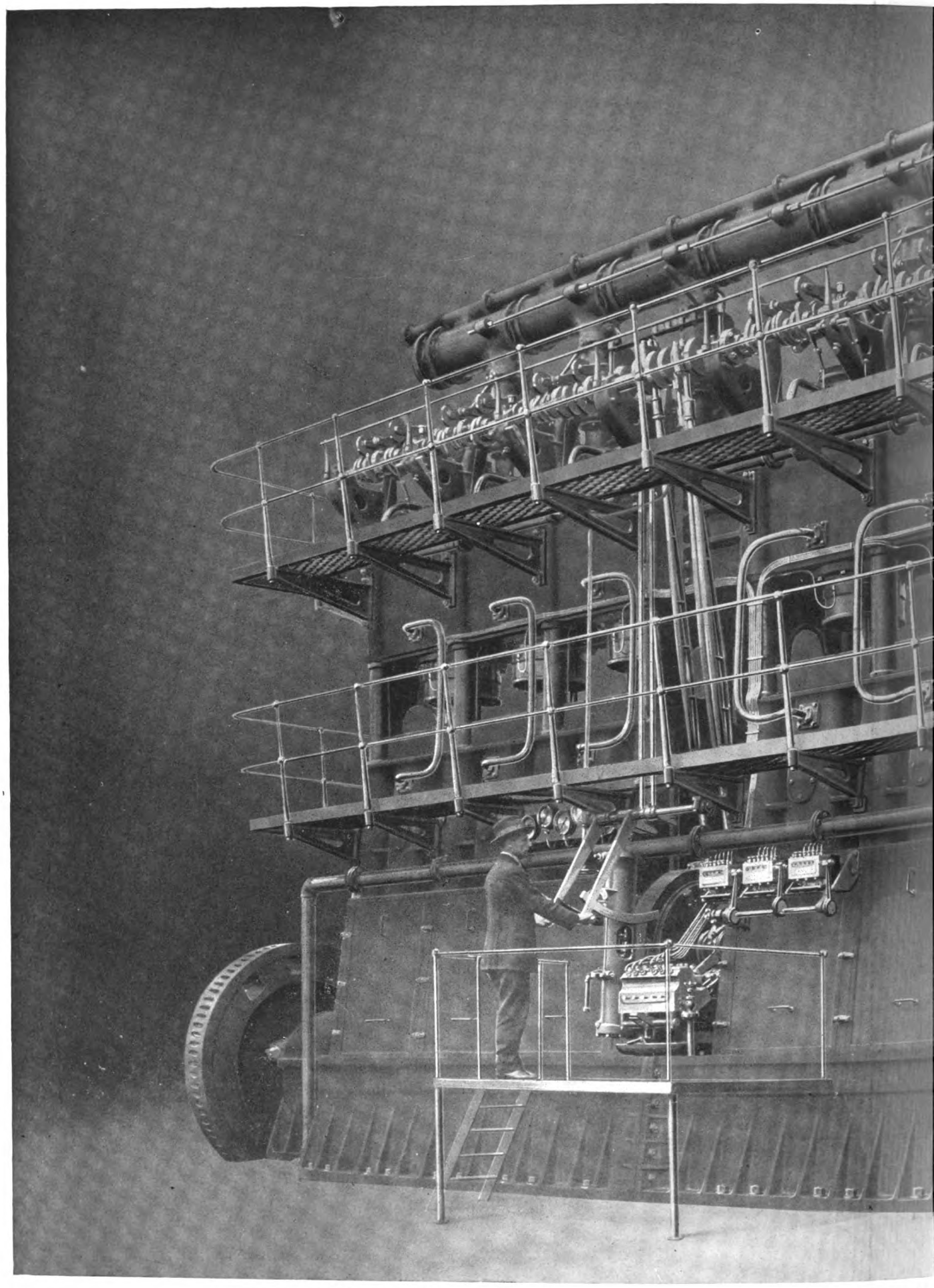

ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INSTA

PACIFIC DIESEL

OAKLAND,

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DIESEL ENGINES

D IN THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

ENGINE COMPANY

ALIFORNIA

RELIABILITY

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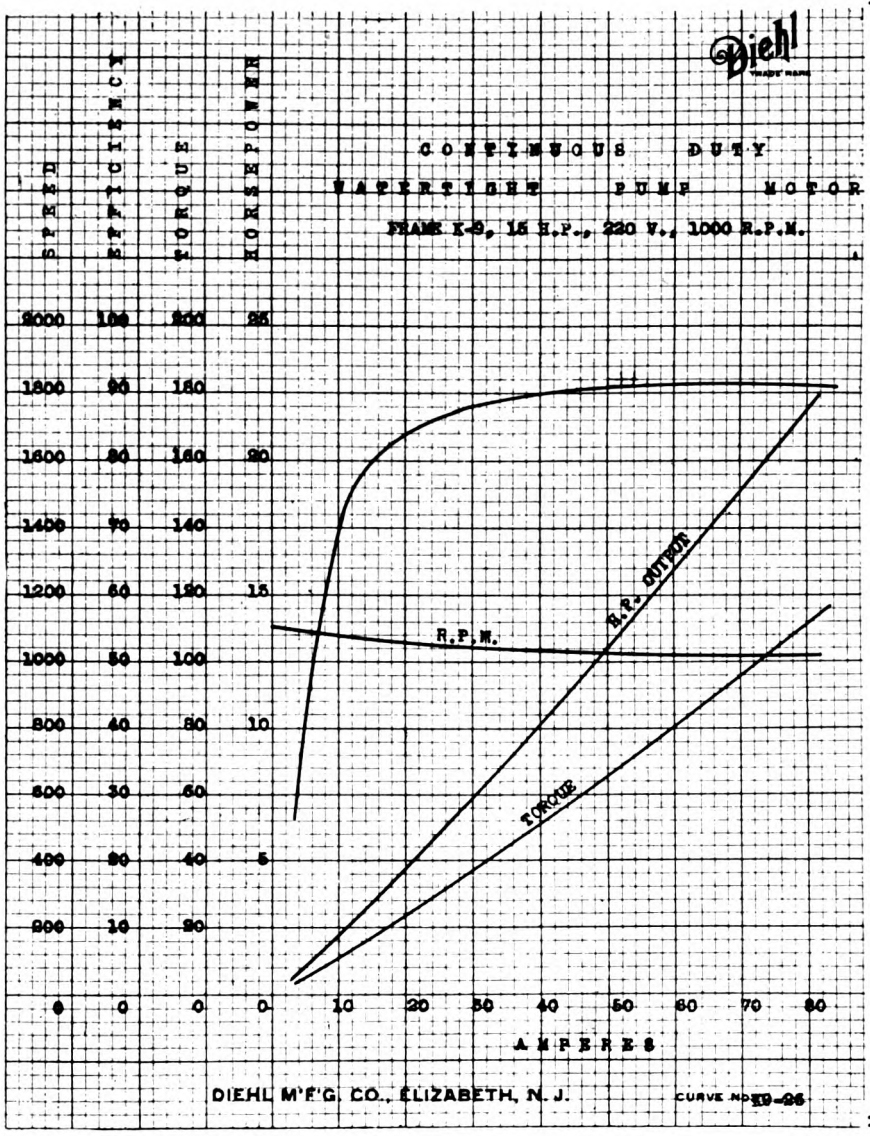

Record of Test 15 H.P. Output for 8 Hours

Temperature Rise °C Thermometer	
Armature Winding	37
Field Winding	30
Interpole Winding	35
Commutator	33
Ball Bearings	22

These motors are now in service on Motorships "Californian" and "Missourian" — American-Hawaiian SS. Co.

Conservative Marine Engineers who contemplate the installation of electric motors on ships and who expect the same reliable service which they are accustomed to obtain from steam driven auxiliaries, will be interested in this motor performance.

DIEHL MFG. CO., Elizabeth, N. J.

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JANUARY TO DECEMBER, INCLUSIVE

1921

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PRICE $8 Net

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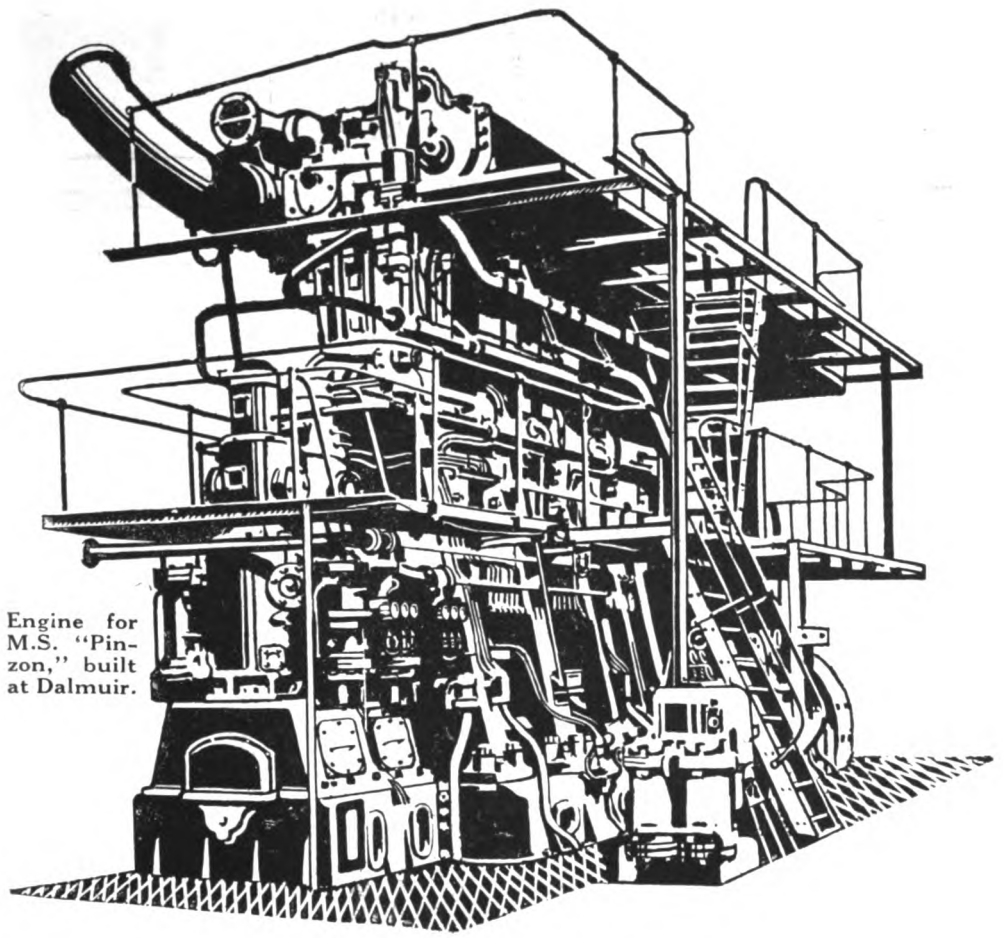
BEARDMORE-TOSI DIESEL *Marine Engine*

THE ENGINE THAT REPRESENTS THE GREATEST ADVANCE IN DESIGN AND IN MARINE PROPULSION



Engine for M.S. "Pinzon," built at Dalmuir.

Results of 100 Hours' Trial.

Average B.H.P.	1,276
Mechanical efficiency, per cent.	77
Average I.H.P.	1,646
Revolutions per minute.	124
Mean pressure on B.H.P. basis, lb. per square inch.	75.5
Fuel consumption, lb. per P.H.P. per hour.	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours.	4.5
Exhaust temperature, average at exit from exhaust valve, deg. Fah.	550
Lubricating oil pressure, lb. per square inch.	10-12
Circulating water pressure (jacket), lb. per square inch.	10-15
Piston cooling water pressure, lb. per square inch.	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average.	125
Piston cooling water, outlet temperature, deg. Fah., average.	130
Blast air pressure, lb. per square inch	1,000

Extract from THE ENGINEER, November 11th, 1921.

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

Full particulars from the builders—

WILLIAM BEARDMORE AND COMPANY LIMITED

NAVAL CONSTRUCTION WORKS: DALMUIR, SCOTLAND.
LONDON OFFICE: 36 VICTORIA ST. S.W.1.

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Fairbanks-Morse "C-O" Marine Oil Engines

The Motorship "H. R. Humphrey"

Helping to catch Menhaden in Chesapeake Bay

The motorship "H. R. Humphrey" uses a 300 H. P. "C-O" Marine Oil Engine and is one of five owned by the same company operating in the Menhaden fishing industry in Chesapeake Bay.

This boat is 134 ft. long, 21 ft. wide, draws 10½ ft. of water, and has a speed of 11½ miles per hour.

"C-O" Marine Oil Engines, 30 H. P. to 300 H. P., economically use low priced fuel oils. They are simple and rugged in design and construction—easy to start. Valveless without igniters, timers, switches, carburetors, magnetos, etc. No hot bulb or water injection. Flexible and dependable.

Fairbanks, Morse & Co.
MANUFACTURERS CHICAGO

The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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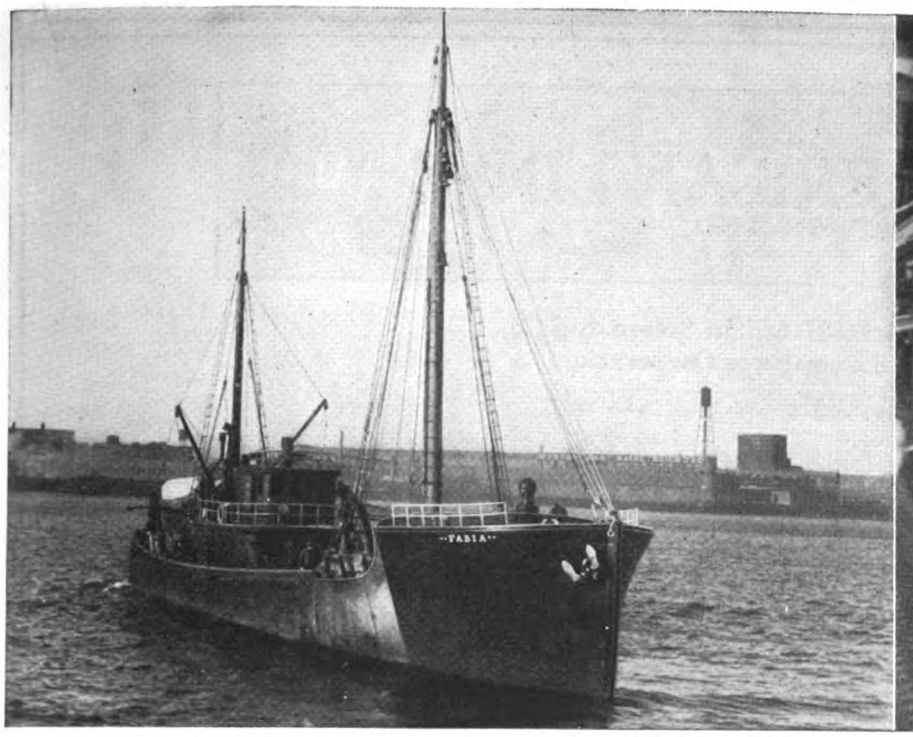
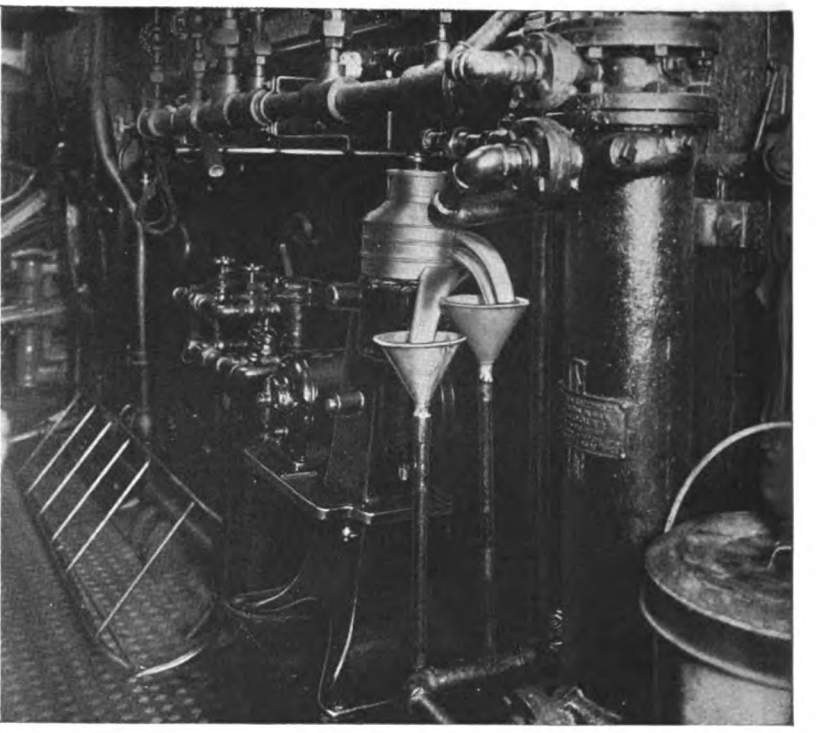


M. S. "Fabia," of the John Chisholm Fisheries Co., Boston, Mass., one of the most economically operated fishing boats.



Mr. Leslie Malloch, chief engineer of the "Fabia," says he would not care to go to sea without the De Laval Purifier shown above.

De Laval Purifier lowers oil consumption and protects engine of Motorship "Fabia"

Since a De Laval Oil Purifier has been made a part of the lubricating system of the "Fabia's" Nelseco 360 hp., 6-cylinder, Diesel type engine the consumption of crank case oil has been reduced to an average of two gallons per 24 hours of operation. More important is the fact that after operating the Purifier for over a year, during which time no oil was taken out of the system, it was only necessary to remove .012-inch shims from four of the crank boxes.

The De Laval Oil Purifier on the "Fabia" is operated all the time her engine is running —which is almost continuously. The 3/16-inch stream of oil that is constantly by-passed through the De Laval yields in 18 hours about one pint of sludge, which is collected in the dirt-holding chamber of the Purifier. That this represents practically all of the sludge generated in the engine was proved when a recent inspection showed the lubricating system to be free from deposits of sludge, dirt or water.

Whether you operate Diesel-driven or turbine-driven vessels, you can save oil and protect their vital parts with the De Laval Oil Purifier. The coupon brings full information. Mail it.

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway Chicago, 29 East Madison St.

Manufacturers' Selling Agents, De Laval Pacific Company, San Francisco, Cal.
Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a

De Laval

Please send Bulletins telling how the operation of ships' engines can be improved and lower lubricating costs obtained, with particular reference to the type of engine checked.

☐ Turbine ☐ Diesel

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Company.....

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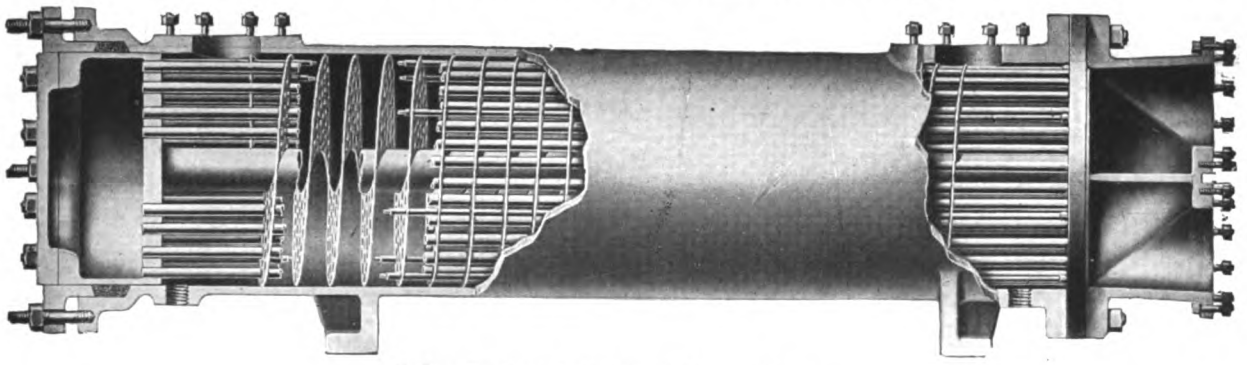

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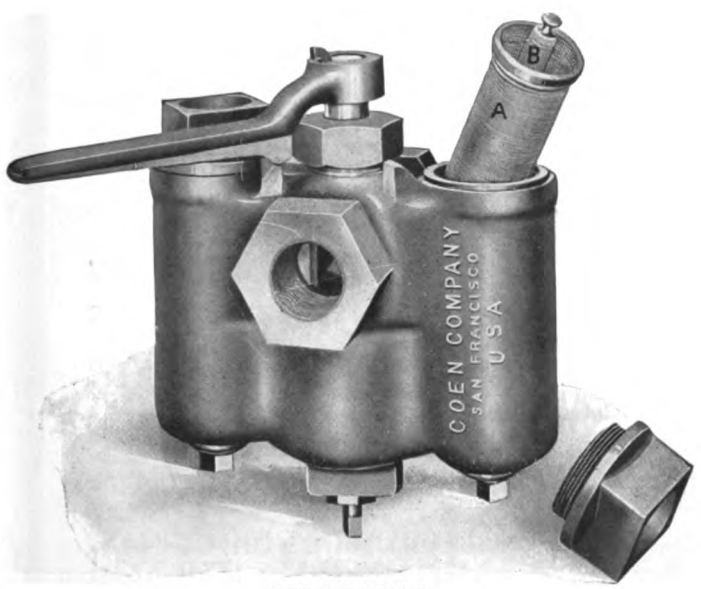

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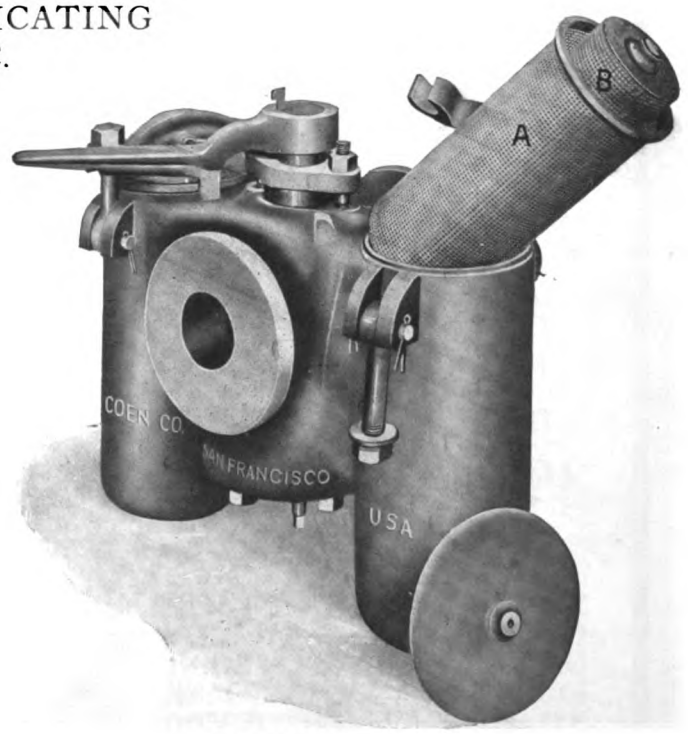

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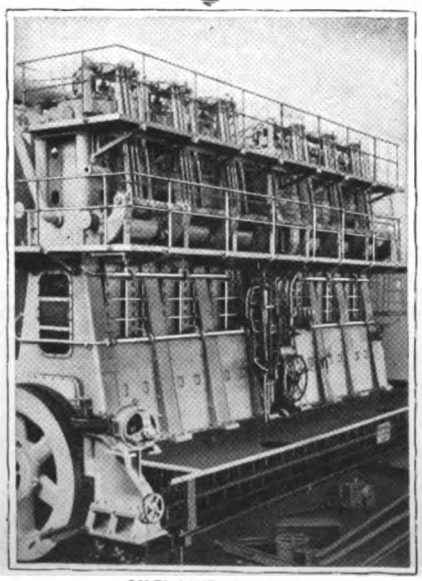

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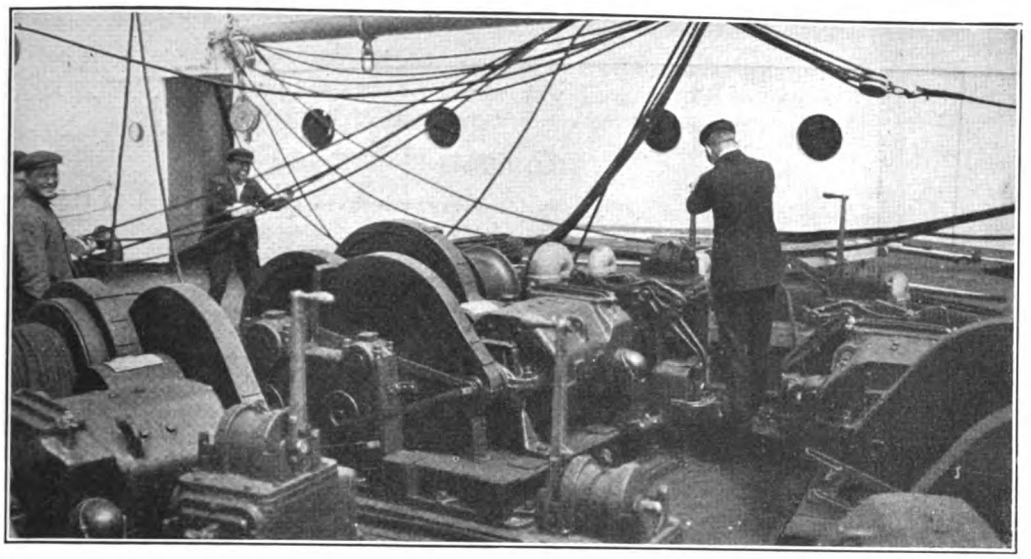

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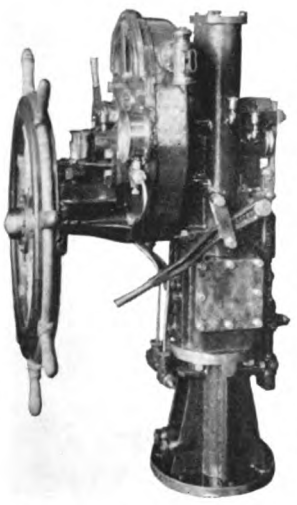

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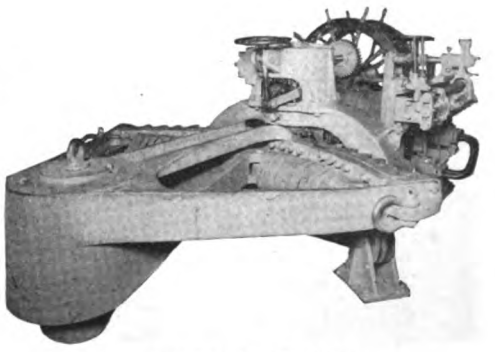

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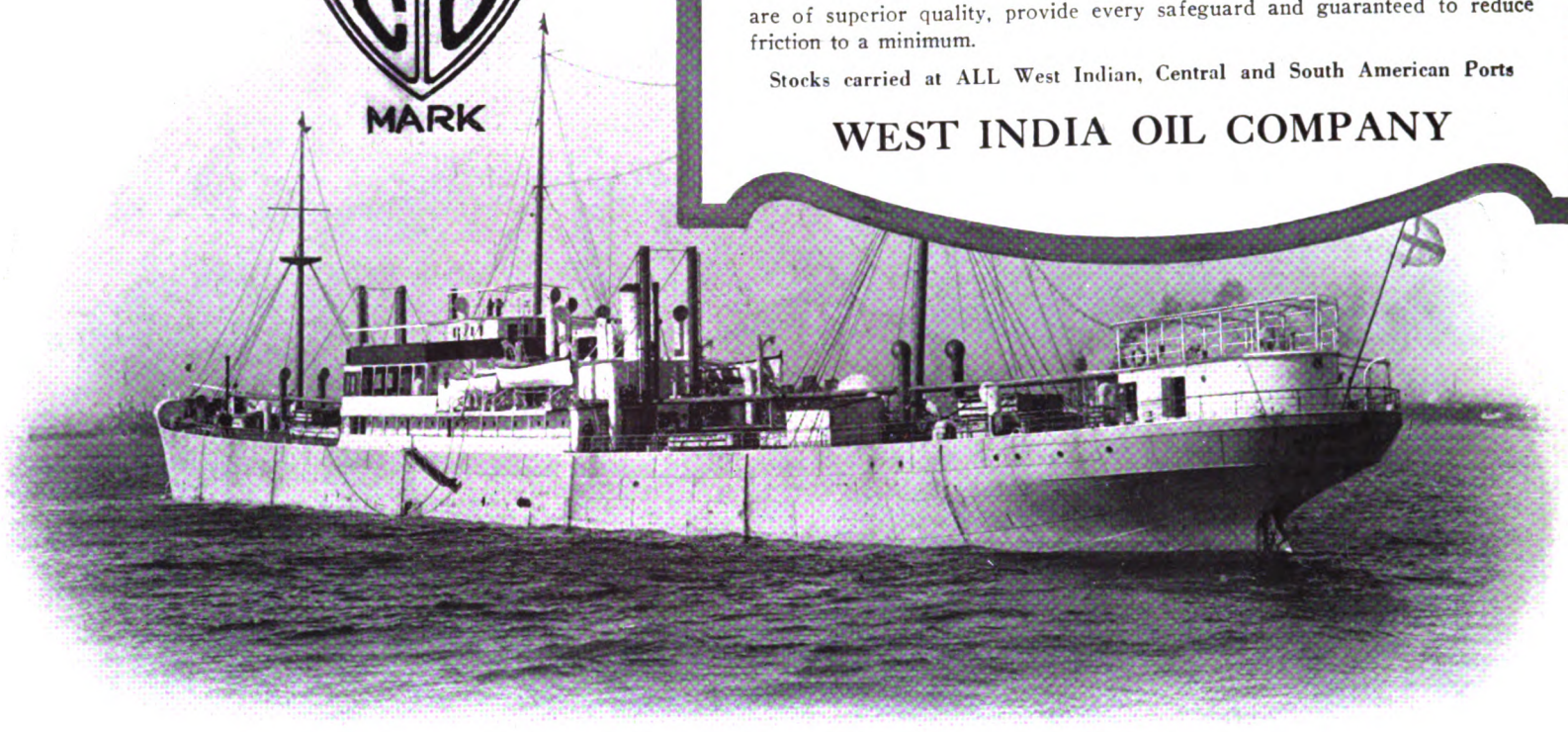

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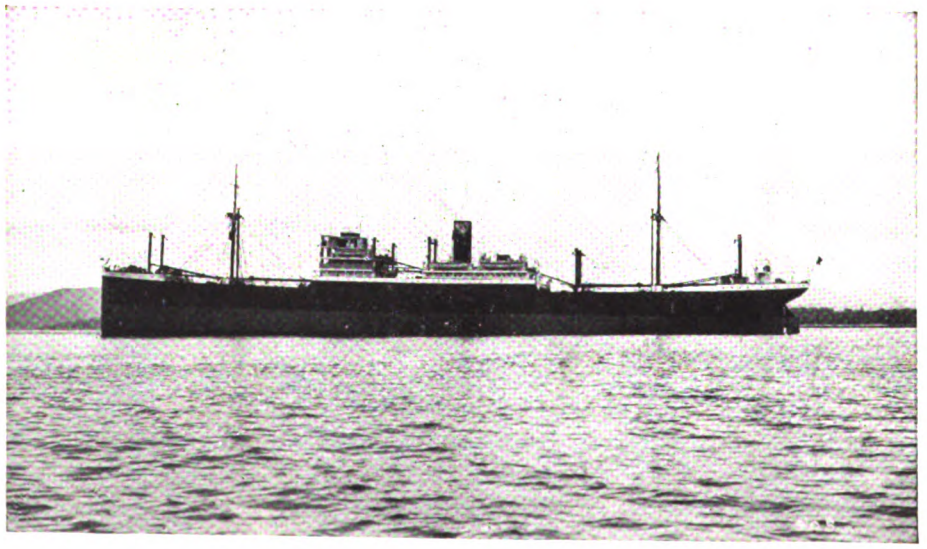

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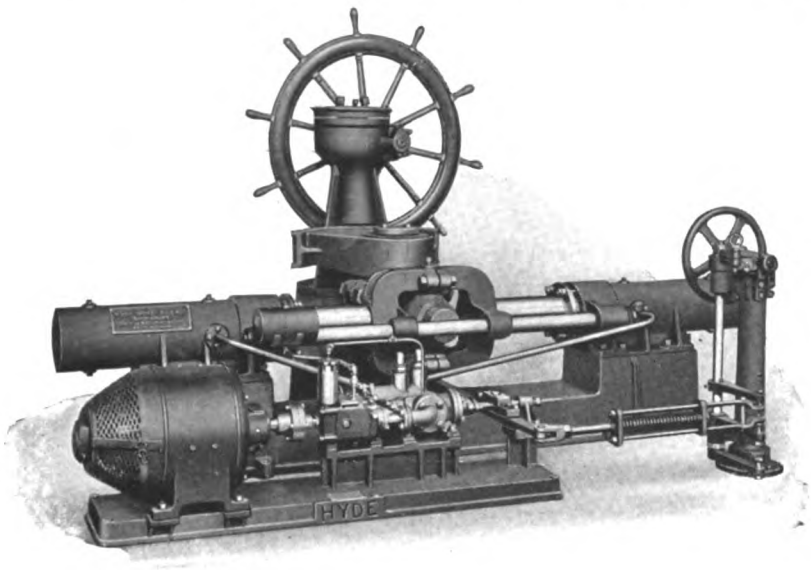

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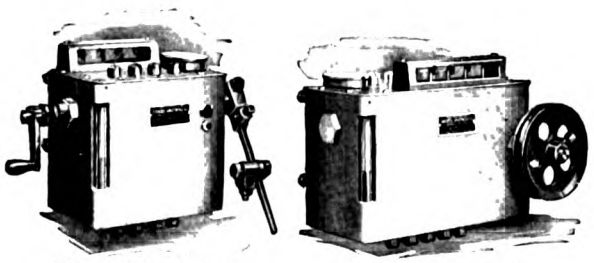

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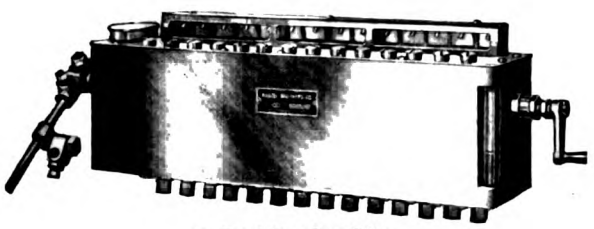

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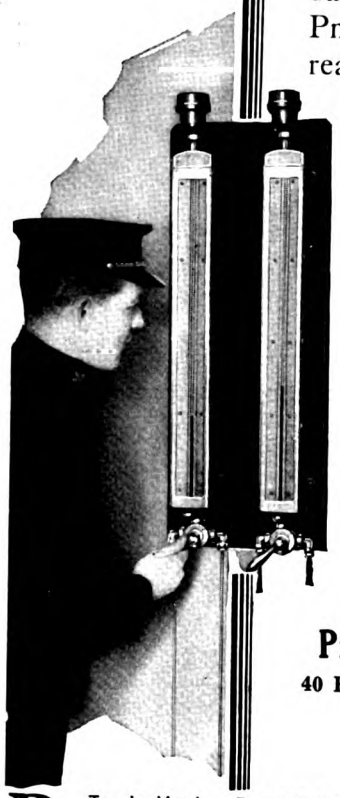

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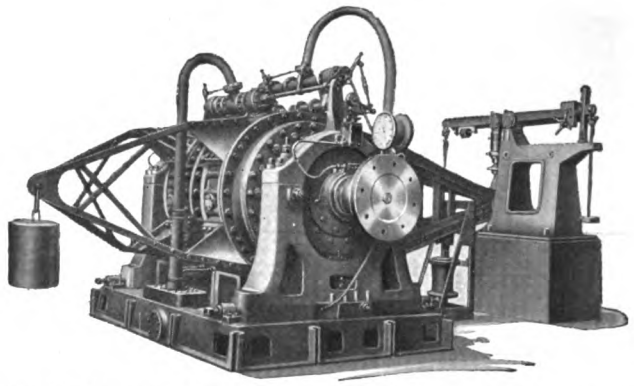

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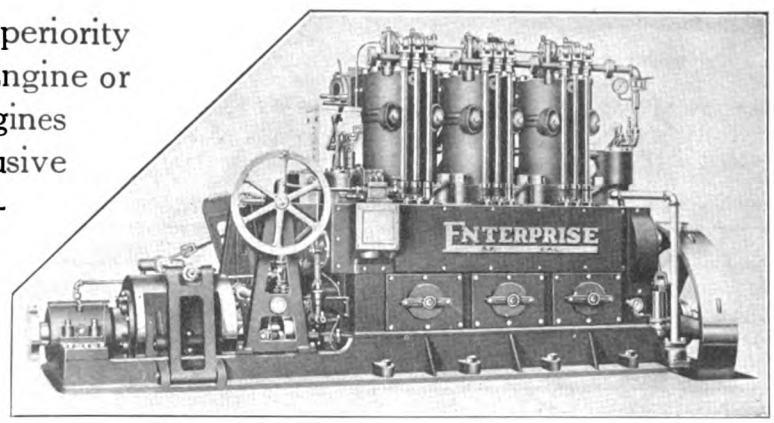

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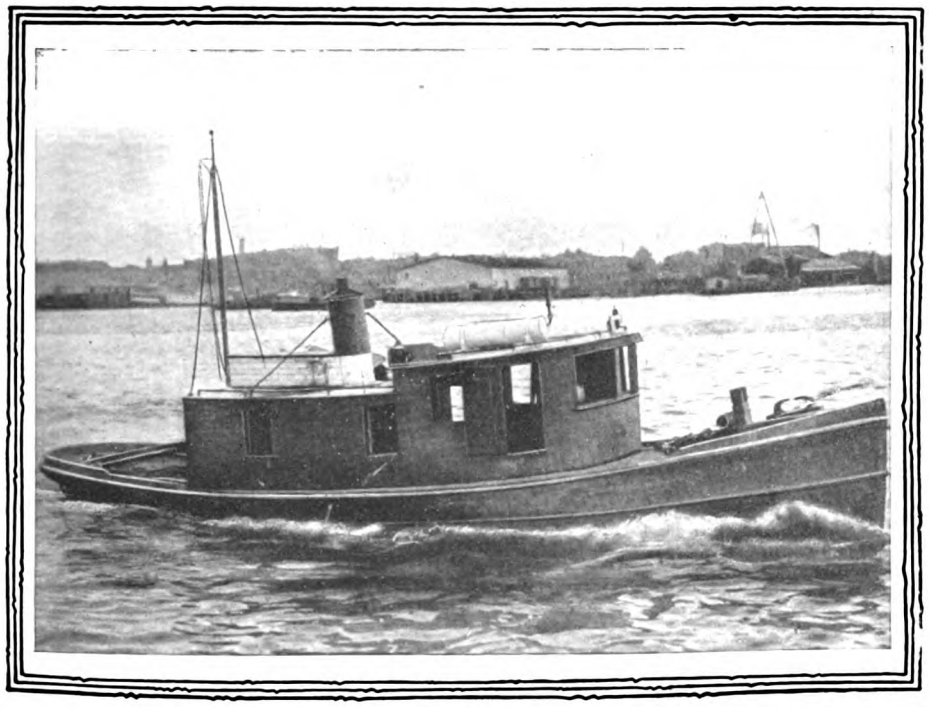

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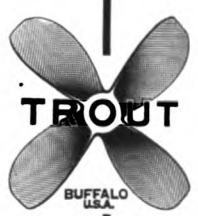

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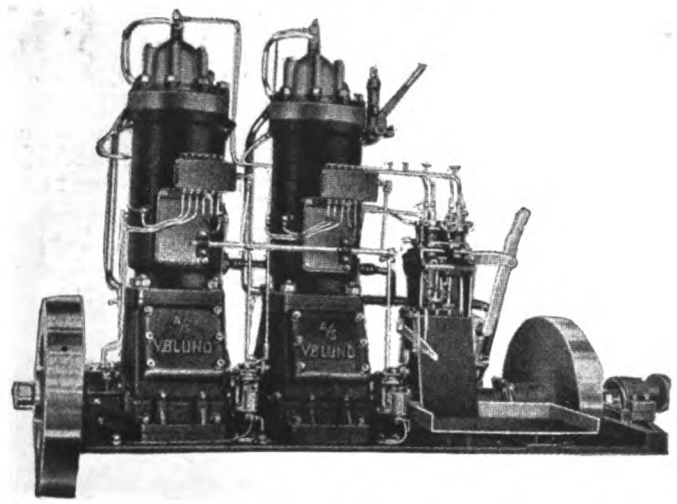

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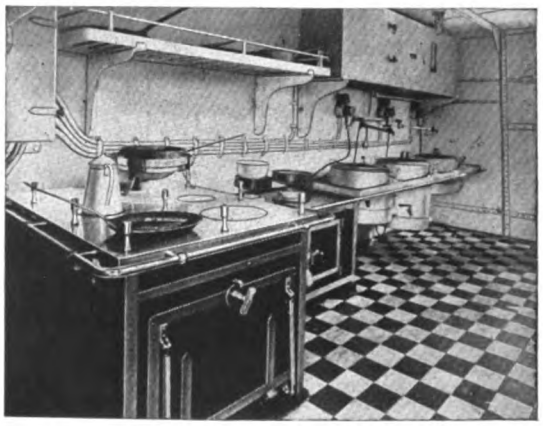

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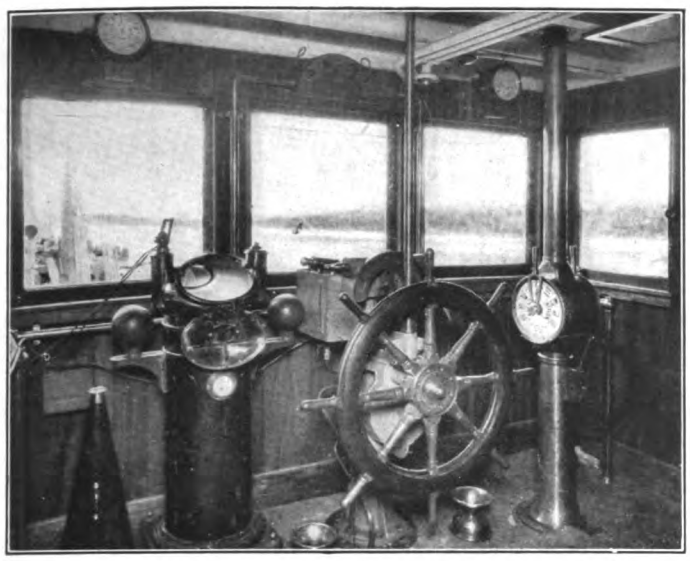

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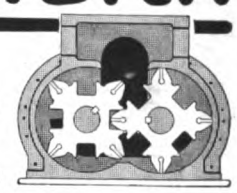

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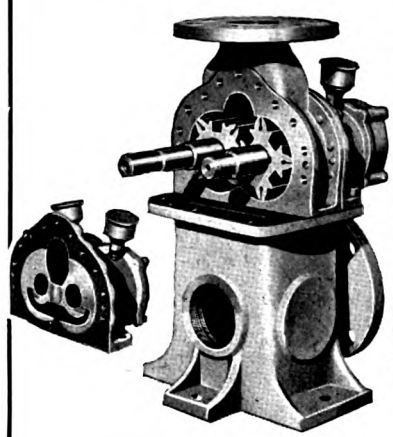
The Northern is an exceptionally good pump for all ship board uses. Write for our new catalog.



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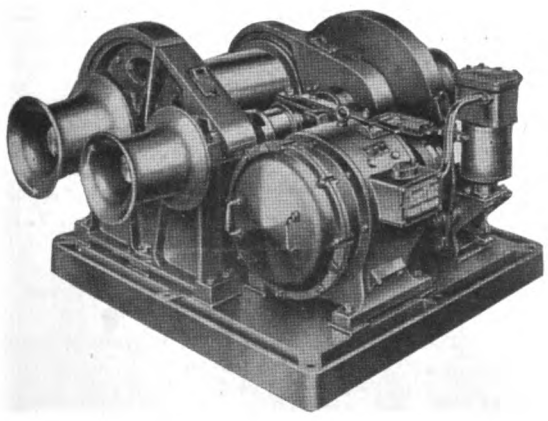

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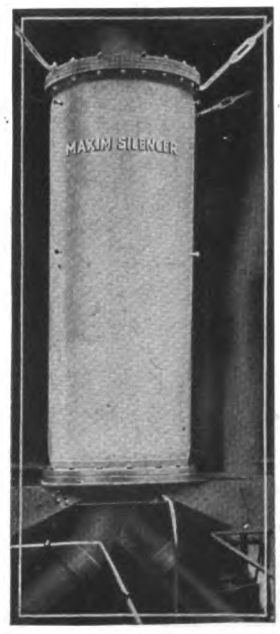

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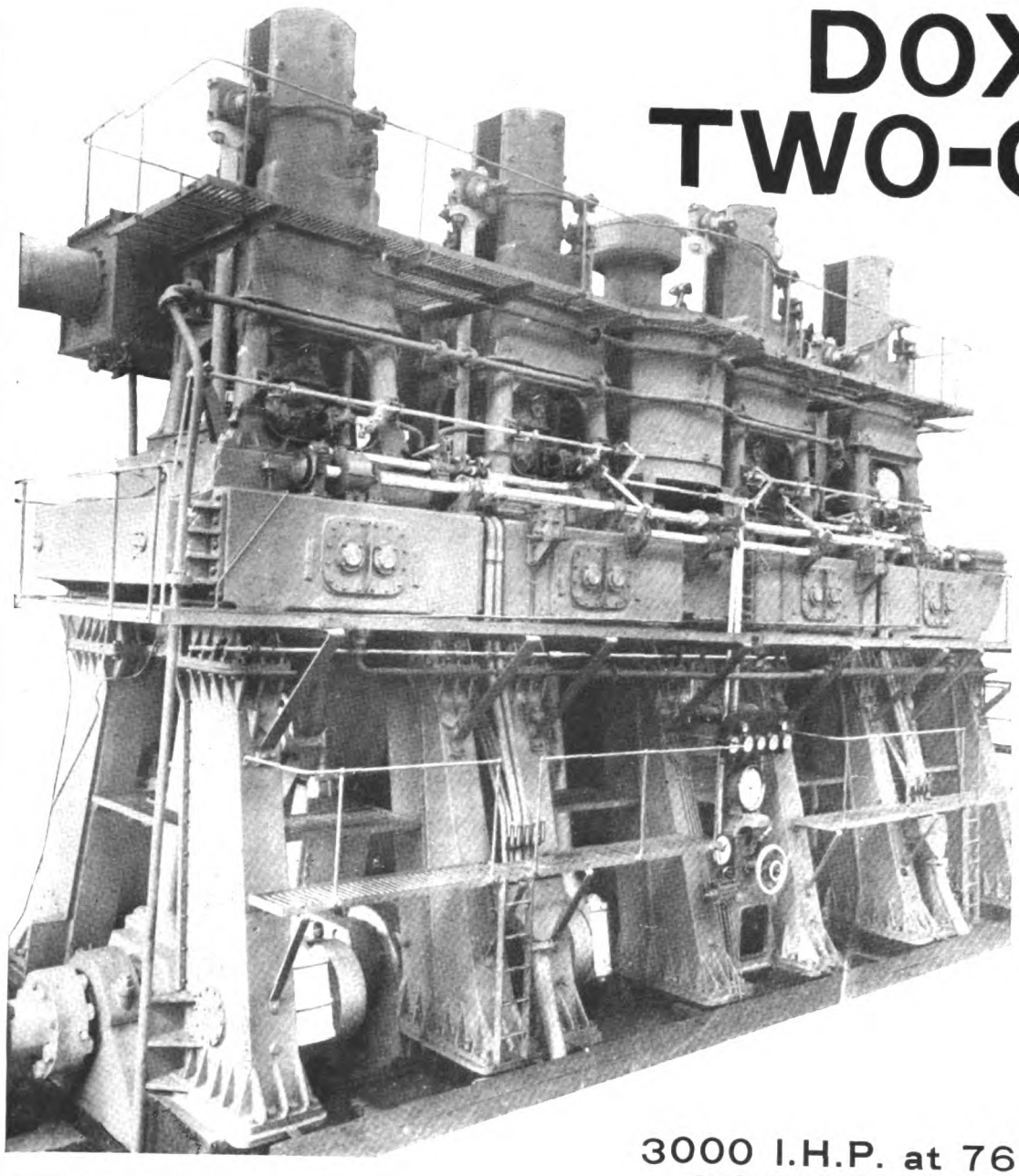
SUN SHIPB
DIESEL

BUILDERS AND

DOXFORD
TWO-CYCLE



3000 I.H.P. at 76 R.P.M.
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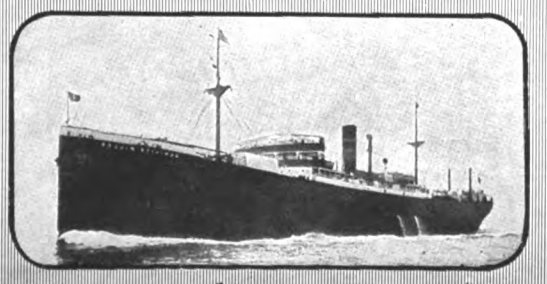

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ISLA DE JAVA	4100
CHALLAMBA	3300
CULBURRA	3300
COCHINCHINE	2500
BAYONNE	1500
COOLCHA	3300
SOLITAIRE	5000
BENOWA	4400
BALCATTA	4400
BABINDA	4400
BOOBYALLA	4400
BORRIKA	4400
MARYLAND	4500
TEXACO No. 146	1000
TEXACO No. 147	1000
J. F. PENROSE	4500
BRAMELL POINT	5000
ASTMAHCO No. 3	3000
ASTMAHCO No. 4	3000
BACOI	2500
CAROLYN FRANCES	1000
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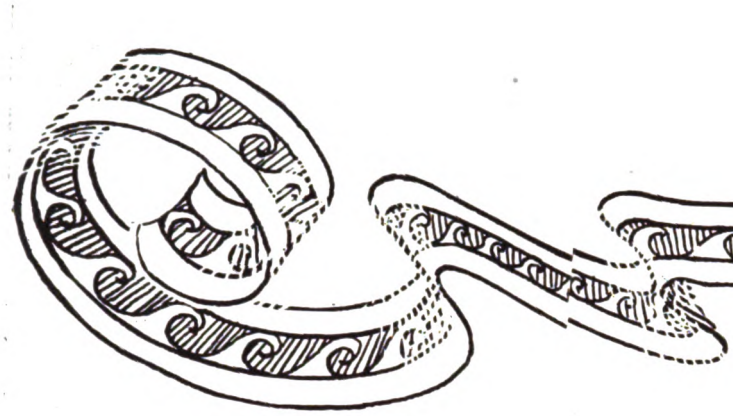

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OIL DIESEL TYPE

The Transportation Service of the United States War Department has SEVEN (7) Diesel Driven River Vessels, duplicates of the boat illustrated herewith, in active cargo and passenger service and giving splendid accounts of themselves.

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Another outstanding example of the economy, dependability and efficiency of Winton Oil Engines in active service. Write for full descriptive catalog.

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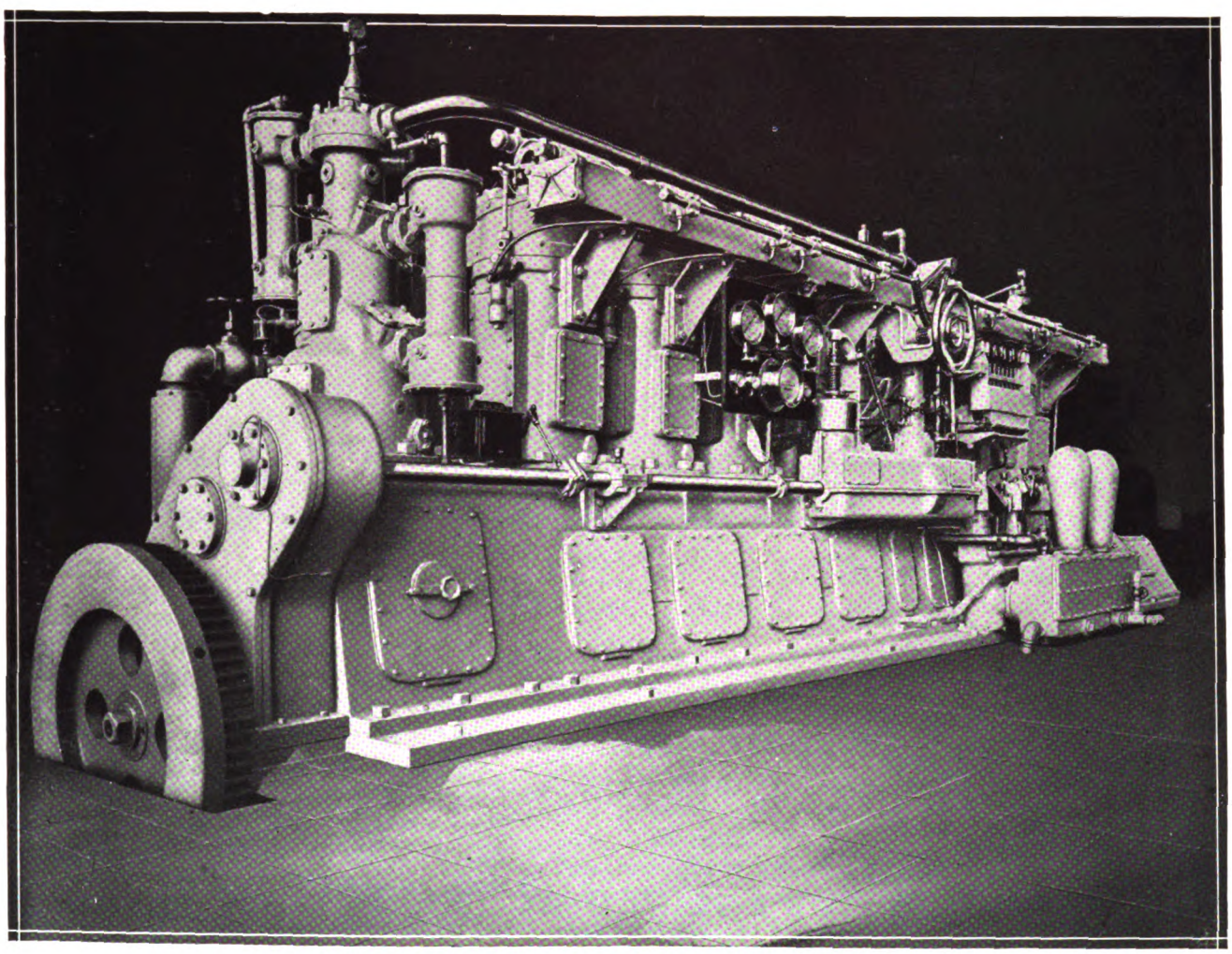

One of the Winton Diesel Engines used in the War Department Vessels

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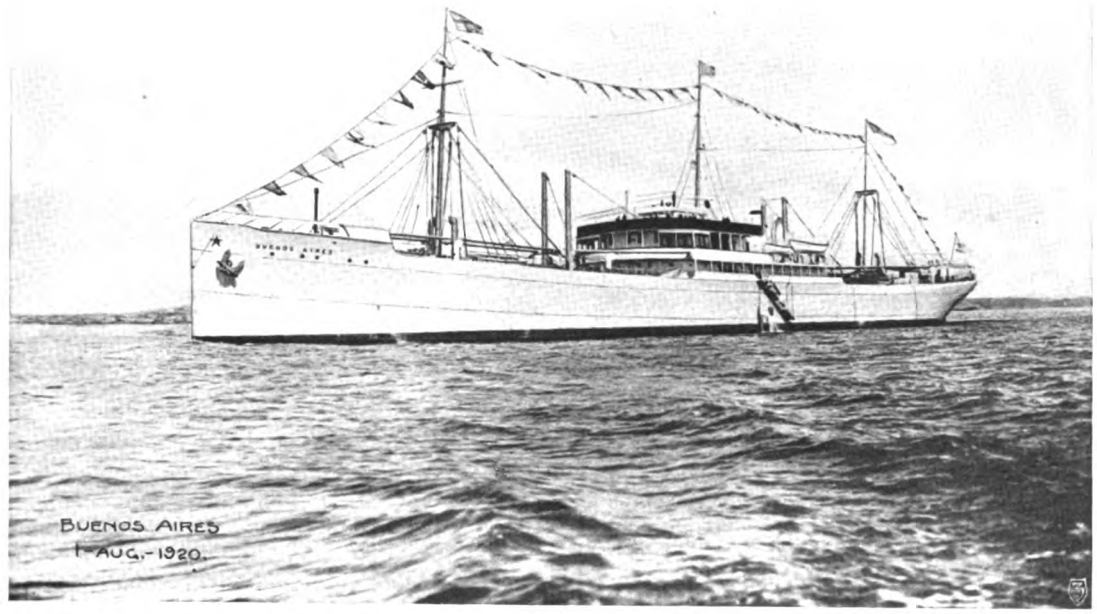
PERFORMANCES OF GÖTAVERKEN MOTORSHIPS



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9,300 tons d. w.; Owners: The Johnson Line, Stockholm

Date of delivery	Jan. 18th 1920
Distance travelled	102,000 Naut. miles
Average speed	11,26 Knots
Oilconsumption per day (incl. auxil.)	10,4 Tons
Power	3,120 I. H. P.
Cruising-radius	42000 Naut. miles

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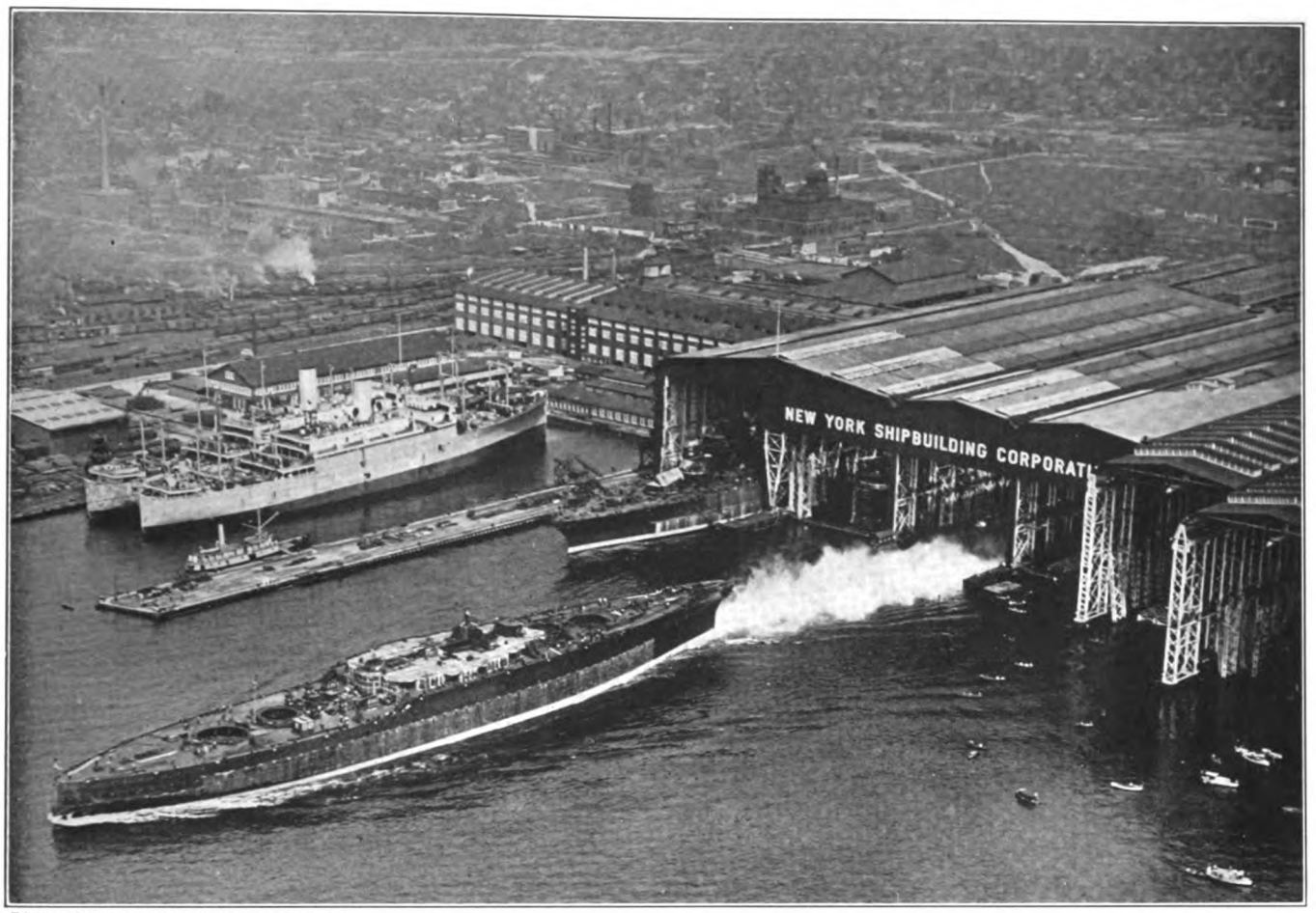

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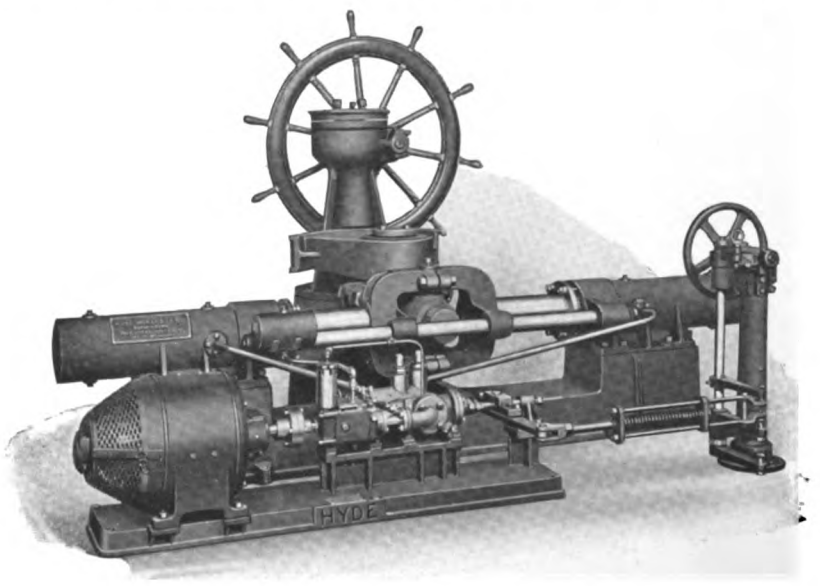

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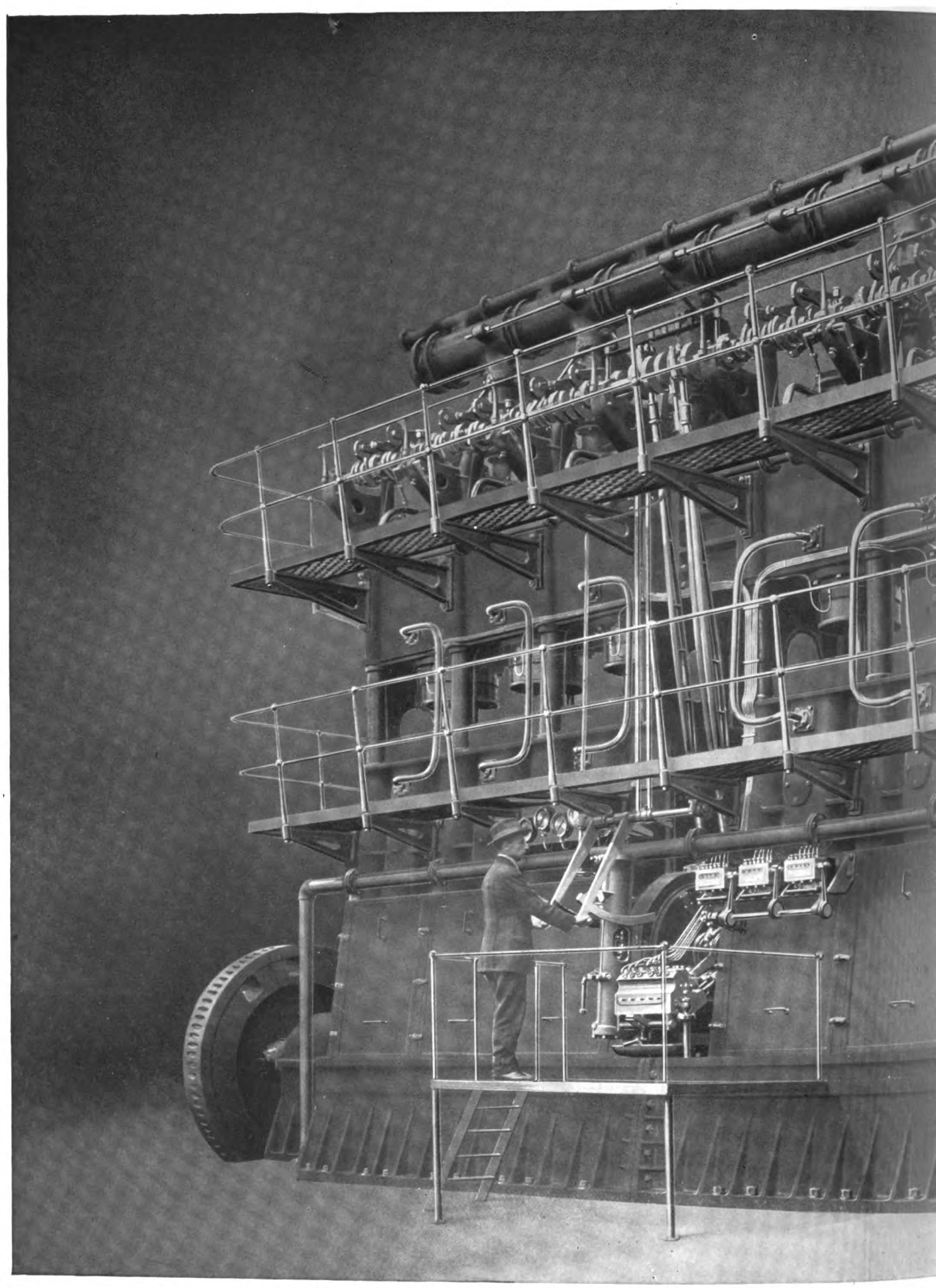

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PACIFIC DIESEL I

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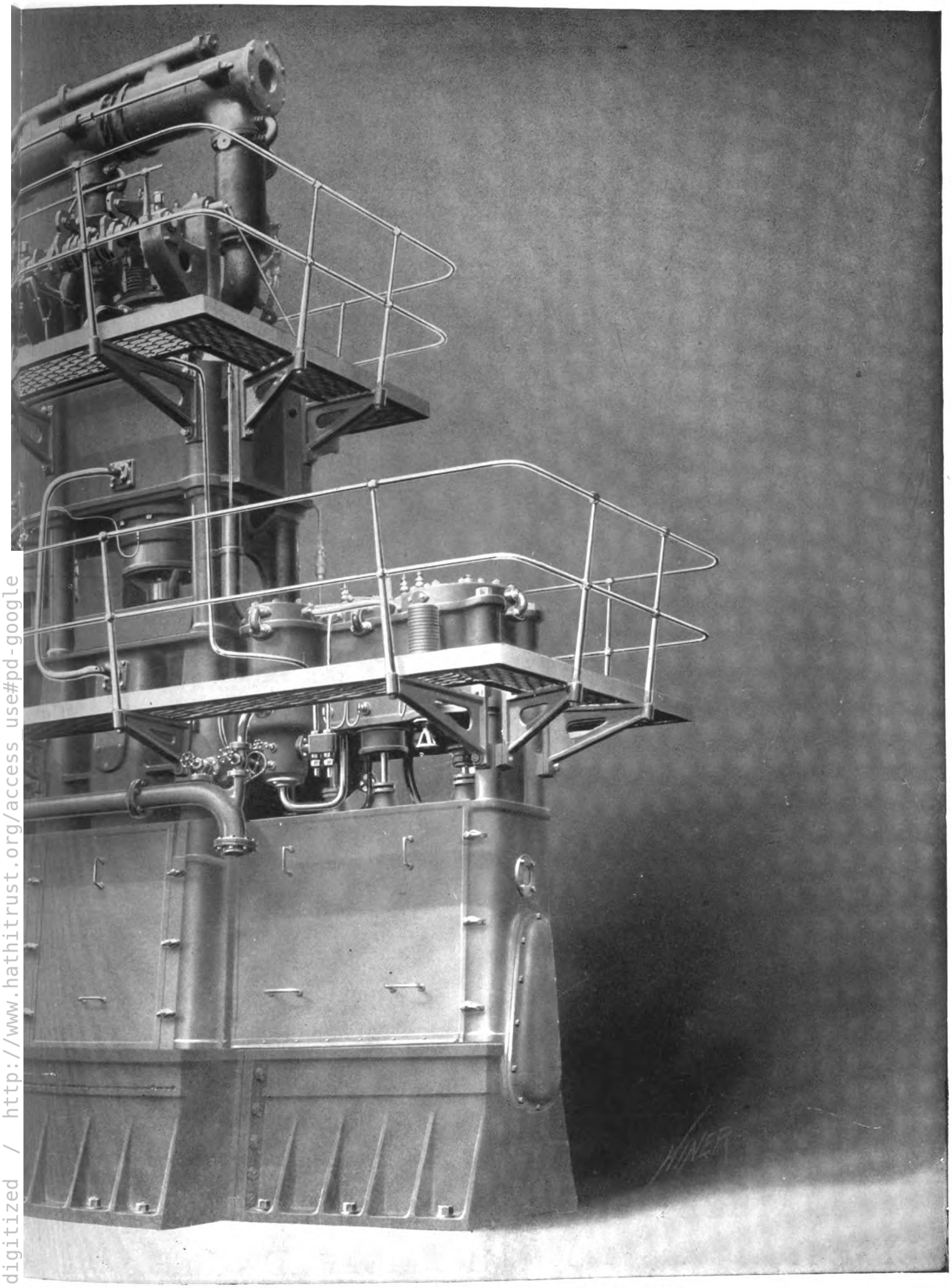

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ENGINE COMPANY

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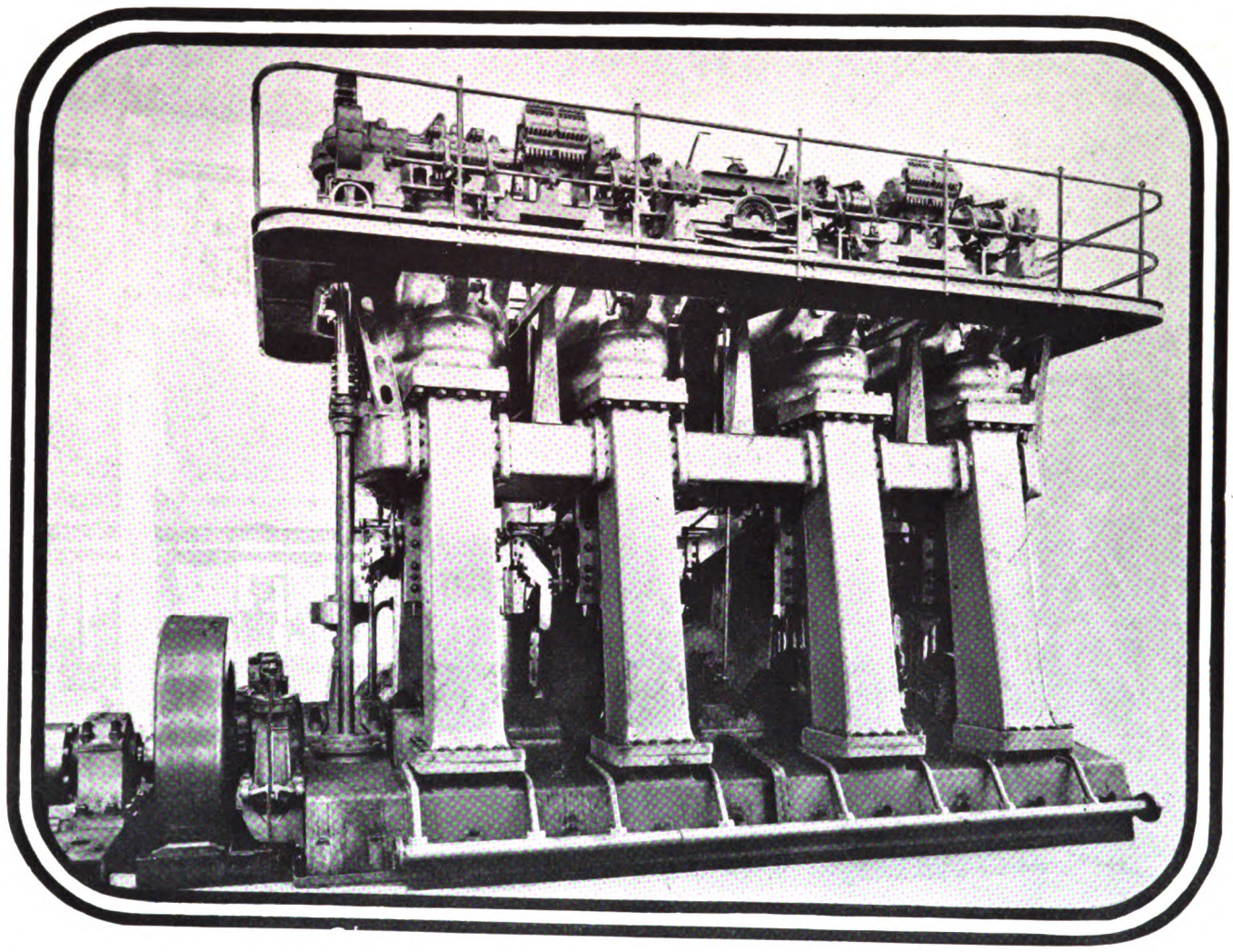

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FOR ALL PURPOSES UP TO 6000 I.H.P.

IN SIZES 3-, 4-, AND 6-CYL. UNITS

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Californian **Missourian** **Wm. Penn**

are fitted with A-E-CO deck machinery

Electro-Hydraulic Steerer	Electro-Hydraulic Steerer	Electro-Hydraulic Steerer
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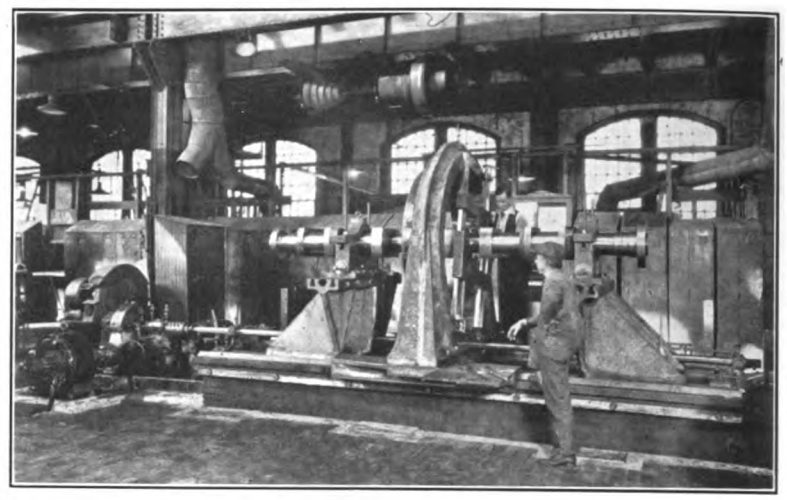

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MIDVALE crank shafts 7" in diameter and larger are finish machined on the special equipment illustrated above. The use of machines of a new type for roughing and finishing these shafts insures accuracy of alignment and prompt delivery.

We are specialists in the manufacture of the heaviest forgings of the highest grade. One marine crank shaft turned our at our Nicetown plant several years ago required the use of an ingot weighing 300,000 pounds.

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CAMBRIA STEEL COMPANY

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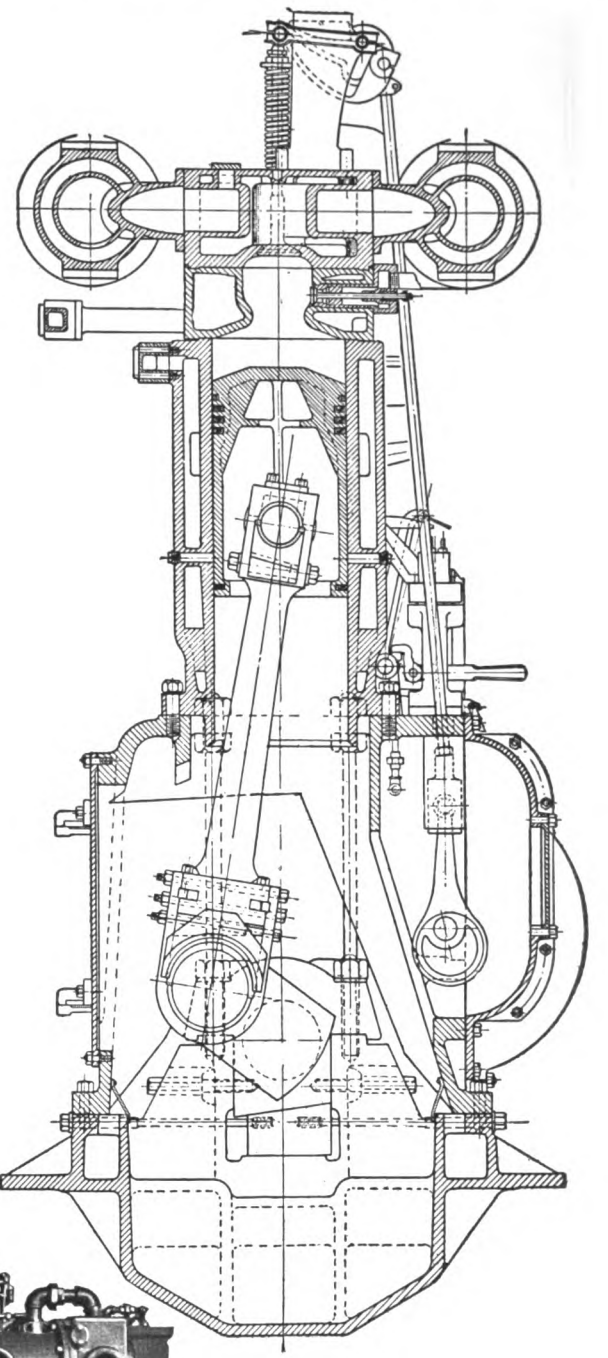
The Simplicity of Price-Rathbun Marine Oil Engines



Ease of control and rapidity of manoeuvring are characteristic of Price-Rathbun Marine Oil Engines.

Reversing is accomplished by interchanging the functions of the exhaust and intake valves—there is no shifting of the cam shaft.

Seven seconds is the average time required for reversing from full speed ahead to full speed astern.

No high pressure injection air compressor is required with Price-Rathbun Engines. Fuel Injection is positive and direct, atomization being obtained without the use of compressed air. The elimination of the complicated high pressure injection air compressor and piping, saves fuel and reduces the chances of breakdown.

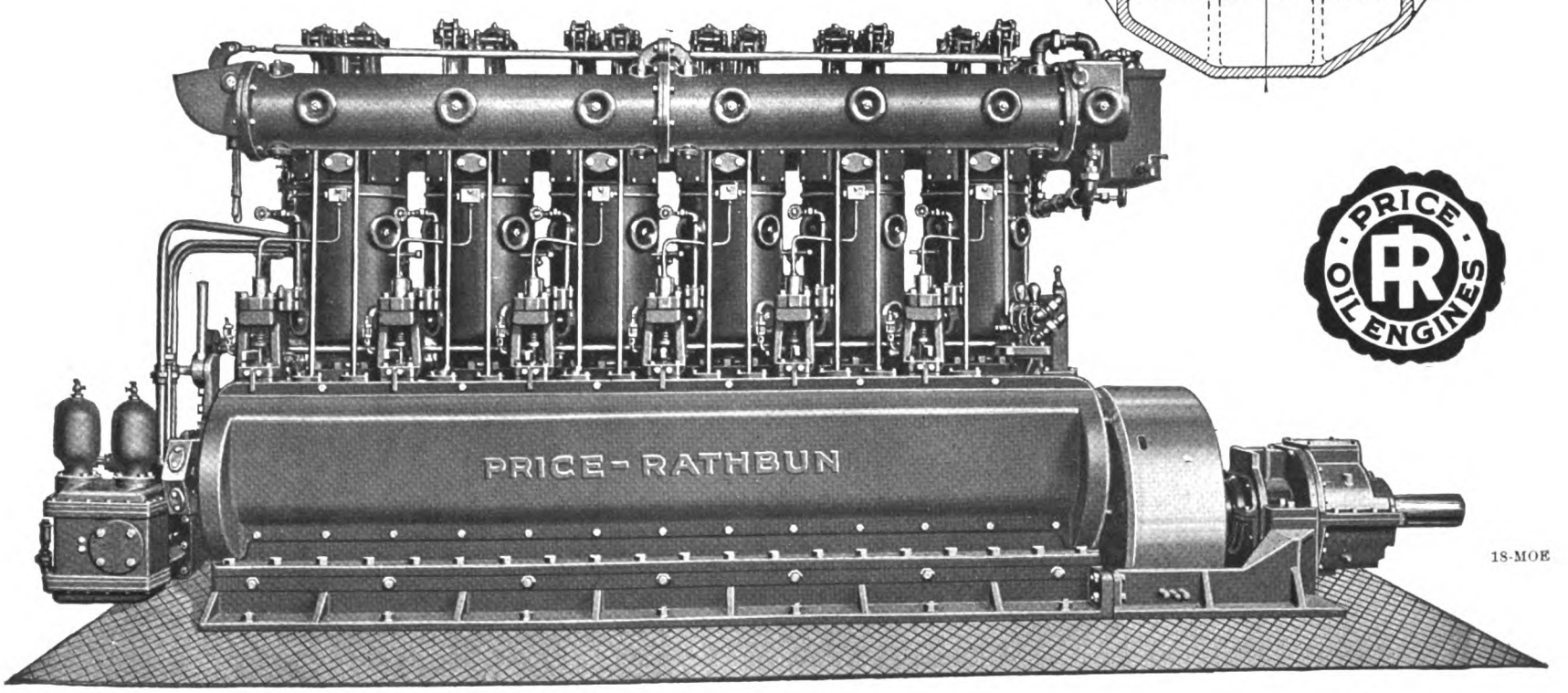
There are no hot bulbs, plates or blow touches as ignition is accomplished by temperature of compression *only*.

High fuel economy and the low consumption of lubricating oil combined with overall simplicity and ruggedness commend the Price-Rathbun Marine Oil Engine for installations requiring from 220 to 750 brake horse power.

Bulletin 10,003

INGERSOLL RAND COMPANY, 11 Broadway, New York City

Butte	El Paso	Knoxville	Cleveland	Philadelphia
Birmingham	Seattle	Scranton	Pittsburgh	San Francisco
Duluth	St. Louis	London	Los Angeles	Salt Lake City
Denver	Chicago	Paris	Detroit	Joplin
Boston	New York	Houghton	New Orleans	Dallas



PRICE OIL ENGINES

18-MOE

Ingersoll-Rand

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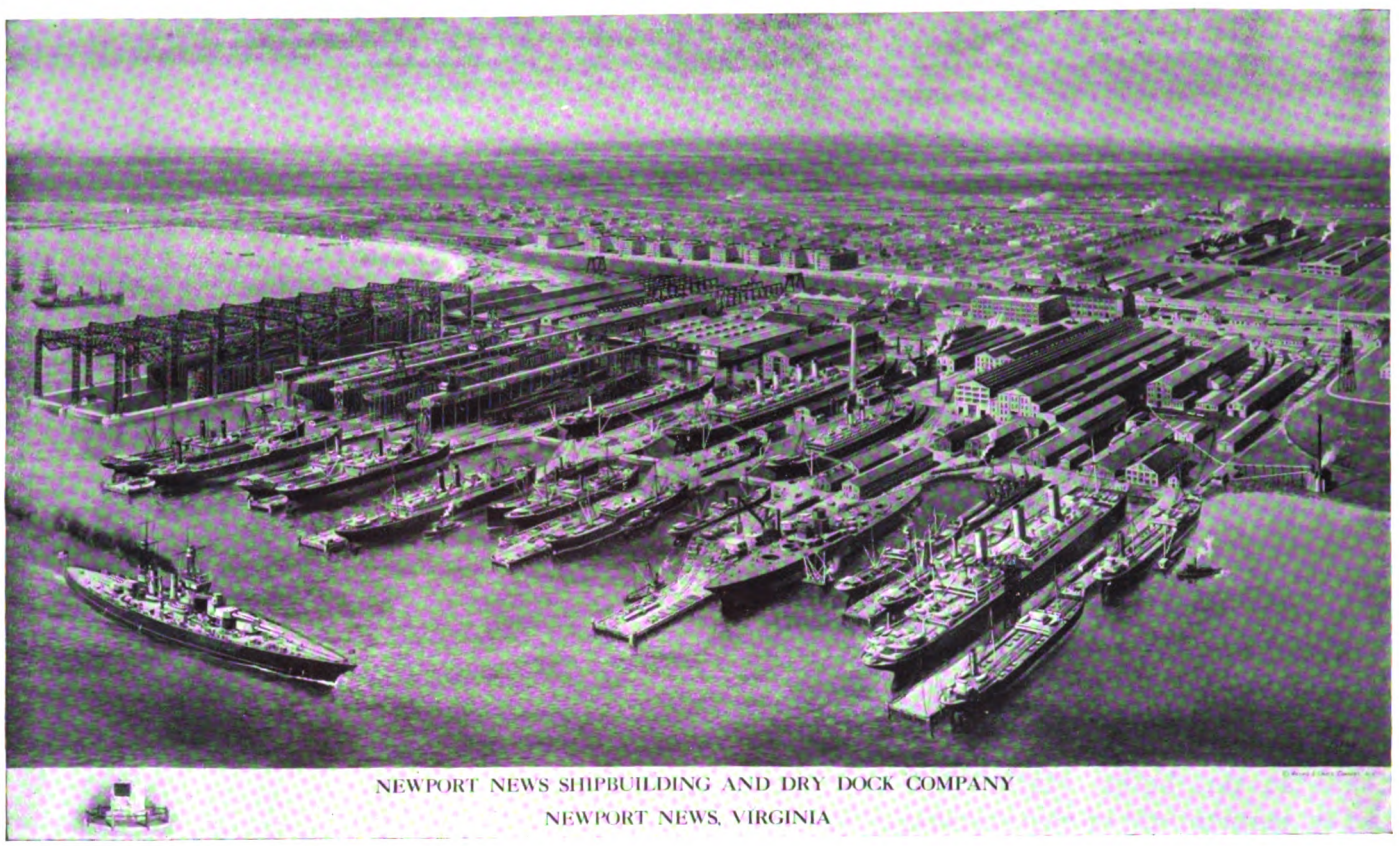
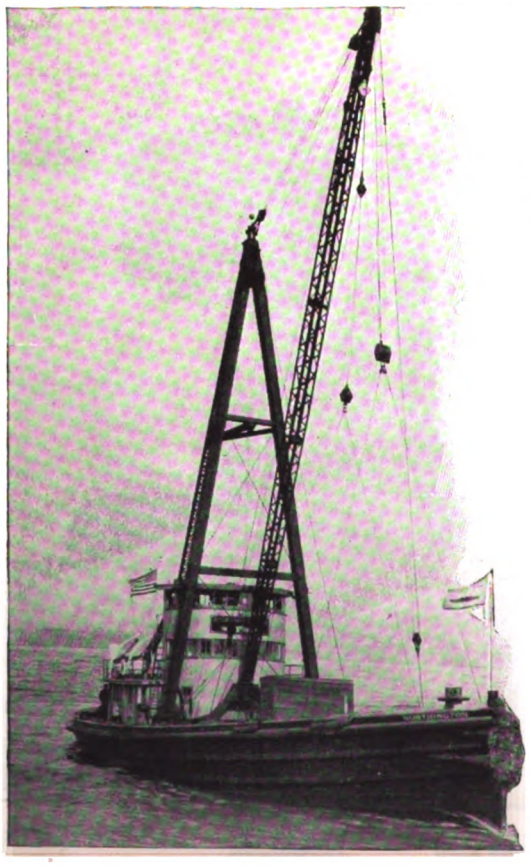


NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY
NEWPORT NEWS, VIRGINIA

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY
SHIP BUILDERS AND SHIP REPAIRERS
PLANT LOCATED AT NEWPORT NEWS, VIRGINIA, ON HAMPTON ROADS
THREE LARGE GRAVING DRY DOCKS
Steel, Brass and Iron Foundries, Heavy and Light Forgings, Complete Facilities at One Plant for Doing any Ship Repair Job Quickly
ADDRESS
233 BROADWAY, NEW YORK, OR NEWPORT NEWS, VA.



Diesel Driven
Worthington Lighter

This lighter, with its new Worthington Diesel Engine, has demonstrated in several trials in and about the congested New York harbor a flexibility of control surpassing the most responsive steam plant. This is in addition to a handsome saving in operating expense. Fuel bills alone are at least $300 per month less than in a steam lighter of equal capacity.

WORTHINGTON

W 87.4

Worthington Pump and Machinery Corporation
Executive Offices:
115 Broadway, New York City. Branch Offices in 24 Large Cities

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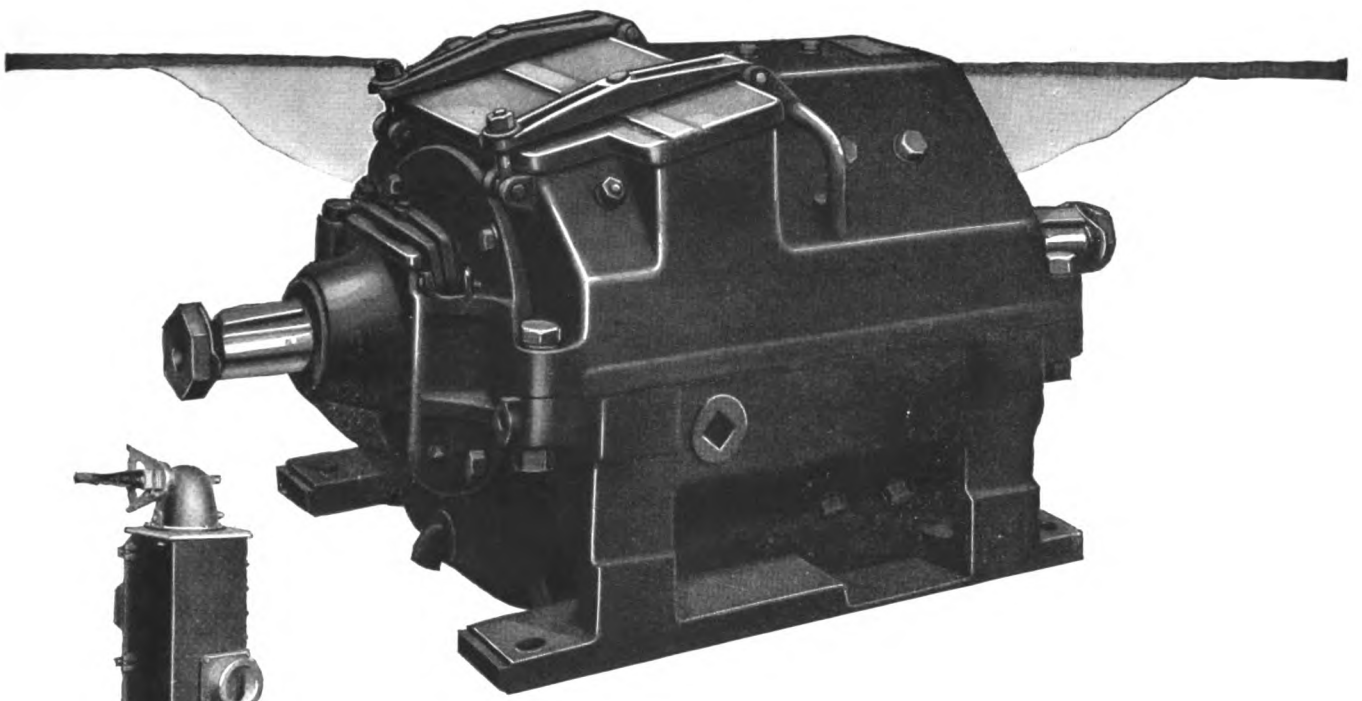
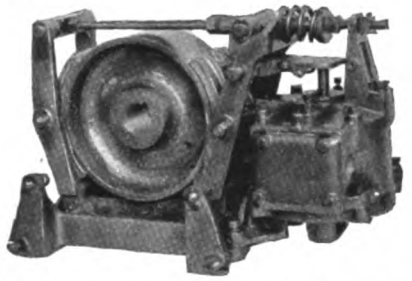
Specify Motors Built for the Deck



Water-tight Controller for COM motor—well protected against damage from submersion.



G-E Solenoid Brake to help the winch motor "hold" its load—gives the operator positive control.

G-E MARINE EQUIPMENT
TO MEET YOUR REQUIREMENTS
Electric Drive for Motorships
Turbine-Electric Drive
Marine-Geared Turbines
Electric Drive for Auxiliaries

Weather and Water Proof

Few places have weather and climate so severe and so varied as on shipboard. Few power applications put such demands upon equipment as is put on a ship's electrical machinery.

Hence, the Type COM motor, water and weather proof, for driving cargo winches, boat hoists, windlasses, capstans—in fact for any intermittent drive on a ship.

Totally enclosed frame with drainage chambers, non-corrodible fittings, moisture resisting insulation, and special-type bearings—these are its features not built into motors for land use. Its control equipment is designed to meet the same conditions.

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

30-31

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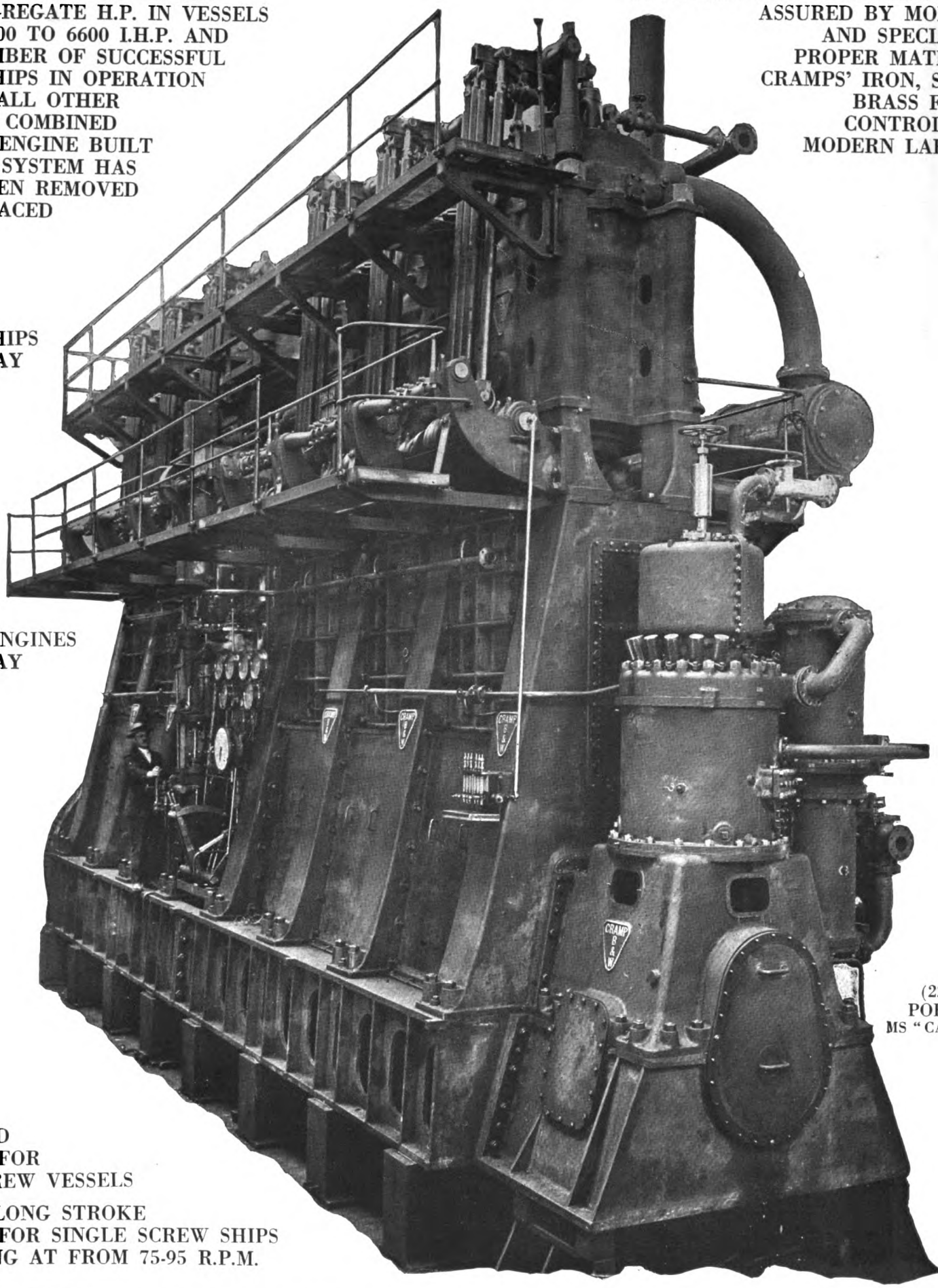
UNDER THE B. & W. SYSTEM
THE AGGREGATE H.P. IN VESSELS
FROM 1500 TO 6600 I.H.P. AND
THE NUMBER OF SUCCESSFUL
MOTORSHIPS IN OPERATION
EXCEED ALL OTHER
SYSTEMS COMBINED
AND NO ENGINE BUILT
TO THIS SYSTEM HAS
EVER BEEN REMOVED
OR REPLACED

ACCURACY AND INTERCHANGEABILITY
ASSURED BY MODERN JIGS
AND SPECIAL TOOLS;
PROPER MATERIALS BY
CRAMPS' IRON, STEEL AND
BRASS FOUNDRIES
CONTROLLED BY A
MODERN LABORATORY

MOTORSHIPS
THAT STAY
ON THE
SEAS

DIESEL ENGINES
THAT STAY
IN THE
SHIPS



(2250 I.H.P.)
PORT ENGINE
MS "CALIFORNIAN"

STANDARD
ENGINES FOR
TWIN SCREW VESSELS

SPECIAL LONG STROKE
ENGINES FOR SINGLE SCREW SHIPS
OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF
WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE
(Burmeister & Wain System)

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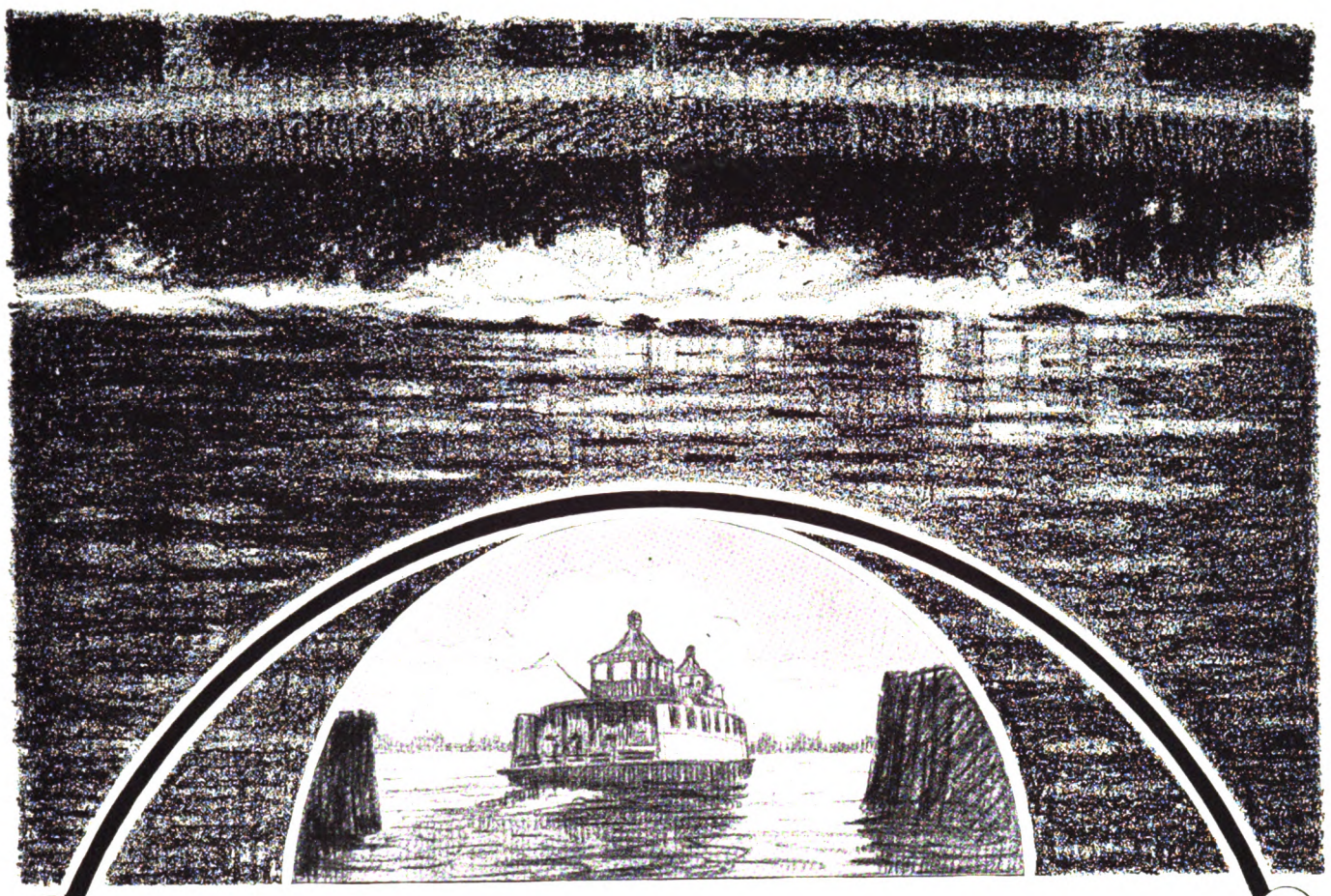

The Forward Propeller! —Does it help or hinder?

Fore

Aft

When the forward propeller is allowed to "idle," it is a drag on the boat.

When both propellers operate at the same speed, as they must in steam engine drive, the water thrown against the bow by the forward propeller has a positive retarding effect.

In neither case can maximum propulsion efficiency be attained.

It has been determined by actual test that maximum propulsion efficiency can only be obtained when the forward propeller turns at just sufficient speed to prevent its acting as a drag.

This is readily accomplished by Diesel-Electric Drive.

In addition. Diesel-Electric drive possesses the best maneuvering qualities, and allows the most complete and effective control from the pilot house. The simple backward or forward movement of a lever effects complete reversal of propellers for operation in either direction at the required speeds.

Experienced Westinghouse engineers will be glad to discuss the merits of this drive with you.

Westinghouse Electric & Manufacturing Company
EAST PITTSBURGH, PA.

Special Pacific Coast Representatives
HUNT, MIRK & COMPANY
San Francisco, California

W WESTINGHOUSE ELECTRIC

Westinghouse

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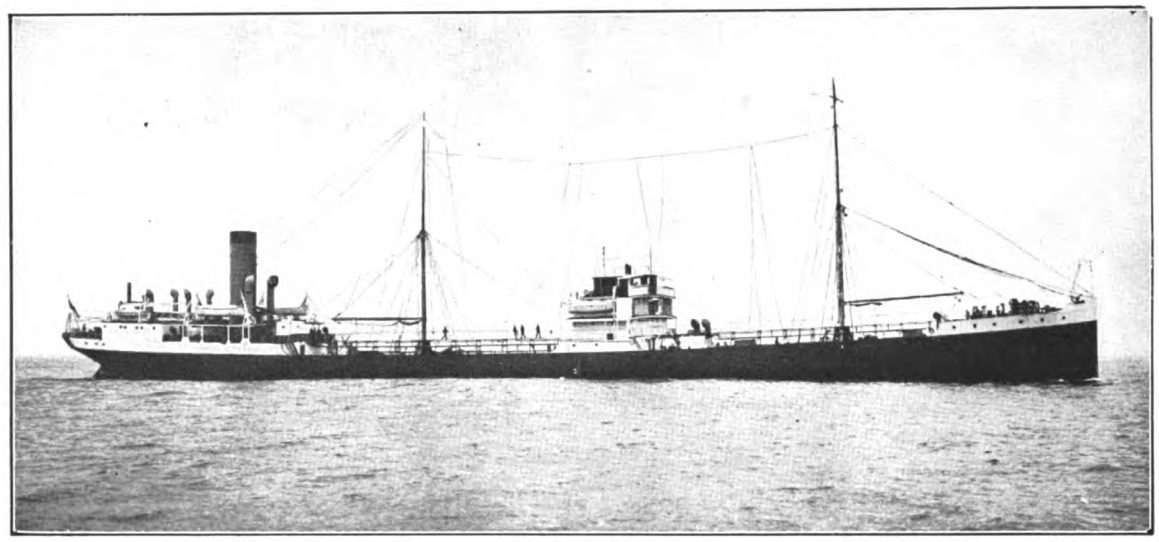
OIL FUEL

THE FUEL OF THE 20th CENTURY

Efficiency ***Economy*** ***Cleanliness***



One of our Fleet of Oil-carrying Ships.

The Asiatic Petroleum Co., Ltd.

ST. HELEN'S COURT, GREAT ST. HELEN'S, LONDON, E. C. 3,

CAN ARRANGE SUPPLIES OF

OIL FUEL FOR MOTORSHIPS, STEAMERS' BUNKERS and INDUSTRIAL PURPOSES at

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Batavia
Bilbao
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Maracaibo (Venezuela)
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New Orleans
New York
Palembang
Pangkalan Berandan
Penang
Perim
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Piraeus
Portland (Oregon)
Port Said
Port Soudan
Pulo Bukom
Puloe Samboe
Rotterdam
Rouen
Rio de Janeiro
Sabang
Saigon
Saitozaki
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San Francisco
San Pedro
Santos
Seattle (Washington)
Shanghai
Singapore
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Southampton
Stöckholm
Suez
Sydney
Svolvaer
Tampico
Tarakan
Trieste
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Tuxpan
Vado
Valparaiso
Vancouver
Venice
Vera Cruz
Yokohama

And New Stations are expected to be ready shortly at

Antofagasta
Bordeaux
Constantinople
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Durban
Funchal (Madeira)
Havre
Ilo Ilo
Port Louis
Port St. Louis Du Rhone
San Juan (Porto Rico)
St. Vincent
St. Nazaire

BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N.Y., U.S.A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

THE Asiatic Petroleum Company also supply **Kerosene Oil** for use in the smaller Internal-combustion Engines and are prepared to supply **Petroleum Spirits, Lubricating Oils, Wax** and **Greases** in all Far Eastern Markets.

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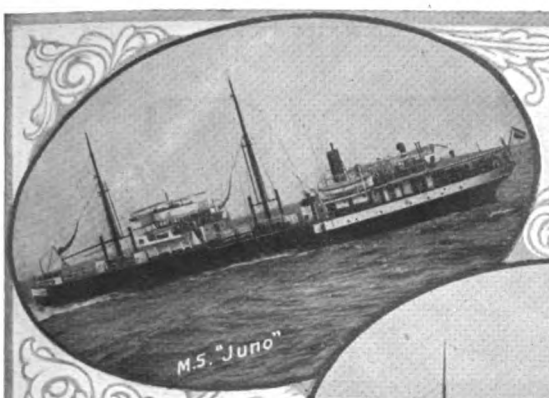
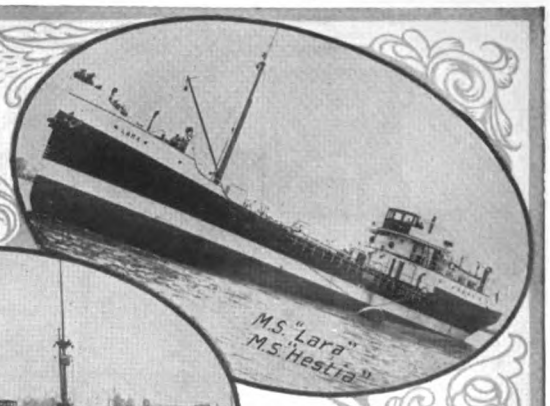
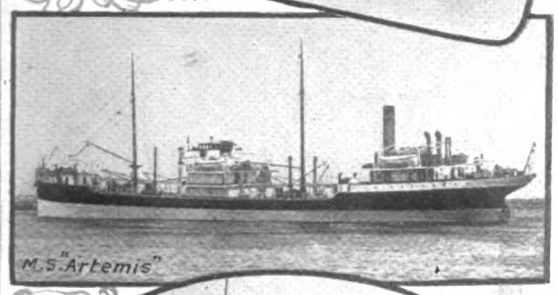
Some WERKSPOOR ENGINED MOTORSHIPS

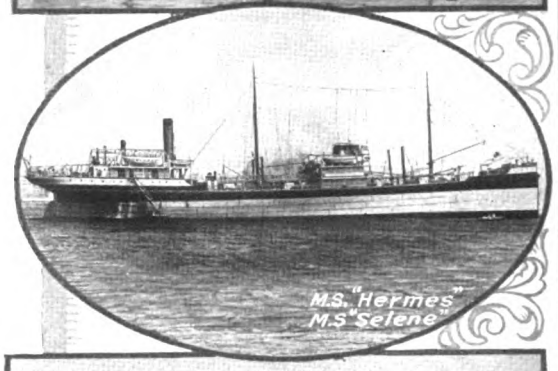






1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800

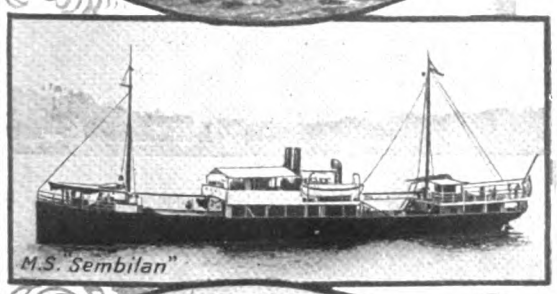


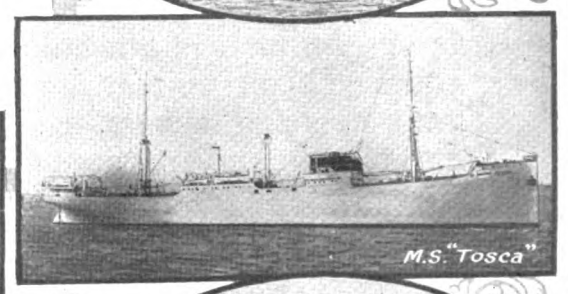
FOUR-CYCLE DIESEL ENGINES

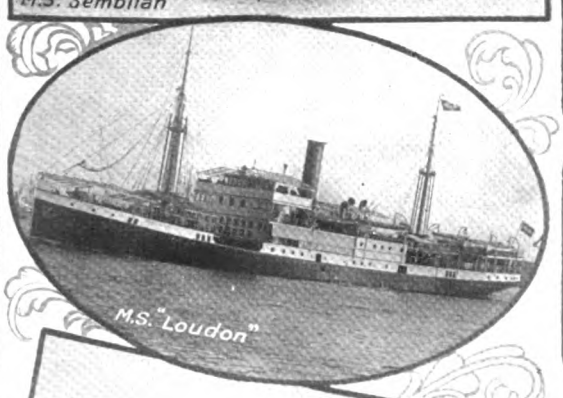
WERKSPOOR

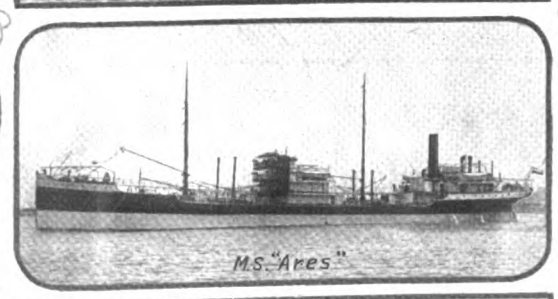
AMSTERDAM - - HOLLAND

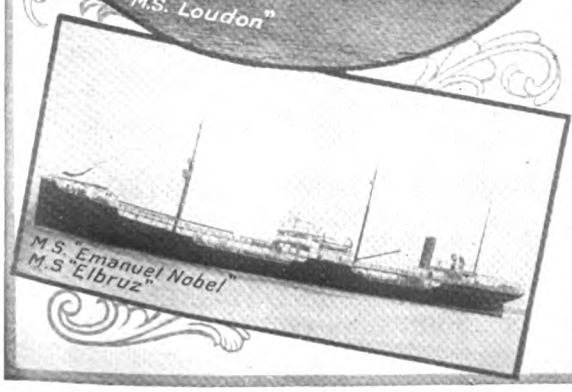
U. S. Representative:
WM. BRAAT
901 Woolworth Bldg., N. Y. City

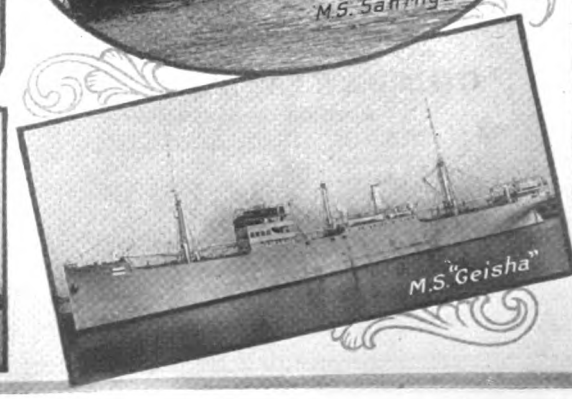












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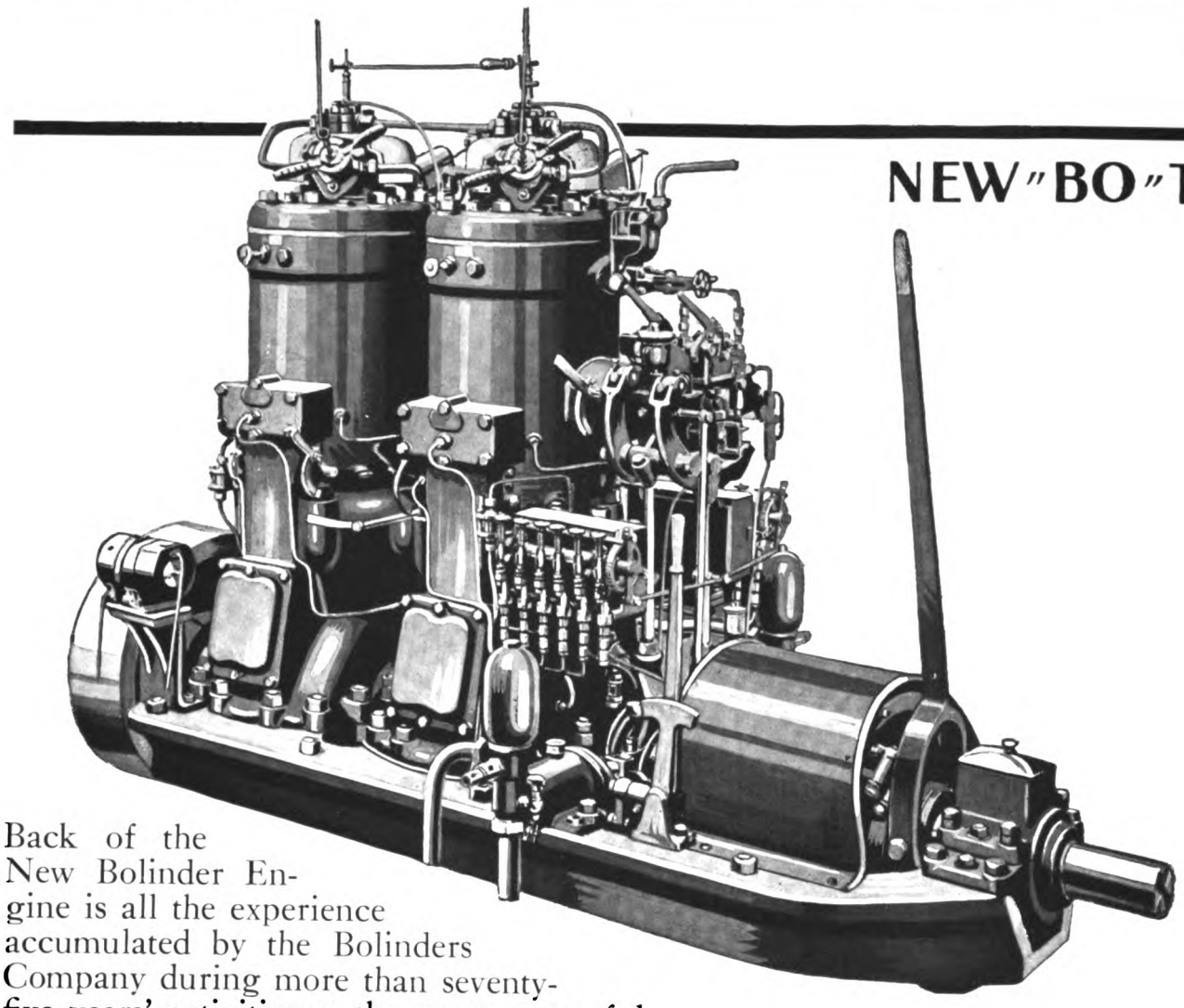
BOLINDERS



NEW "BO" TYPE

Back of the New Bolinder Engine is all the experience accumulated by the Bolinders Company during more than seventy-five years' activities as the most successful builders of high class machinery in Northern Europe and twenty-five years as the world's largest builders of hot bulb engines. With its latest improvements the Bolinder engine is equalled by no other make and is the ideal and most simple power for barges, tugs, small freighters and tankers, fishing vessels and general service boats. The latest ideas in oil engine practice are there combined with the highest grade of workmanship and material as well as the utmost care in construction. The success of a vessel depends upon the success of its power plant. The Bolinders will ensure the successful operation of your vessel.

Sizes from 6 to 500 Brake Horse Power

BOLINDERS COMPANY, Inc., 30 Church St., New York City

BOLINDERS COMPANY, 411 Exchange Building, 53 State Street, BOSTON, MASS.

COMPAÑIA BOLINDER
Avenida de Mayo 560
BUENOS AIRES, ARGENTINA

ROBINSON & HAIGH
Mercaderes 10
HAVANA, CUBA

CARIB TRADING CO.
CARTAGENA, COLOMBIA

FIDANQUE BROS. & SONS
PANAMA, REP. OF PANAMA

HENRY LUND & CO.
Marine Building
SAN FRANCISCO, CAL.

LAMMERS & MAASE, LIMITED
170 McGill Street
MONTREAL, CANADA

ALEXANDER McDOUGALL
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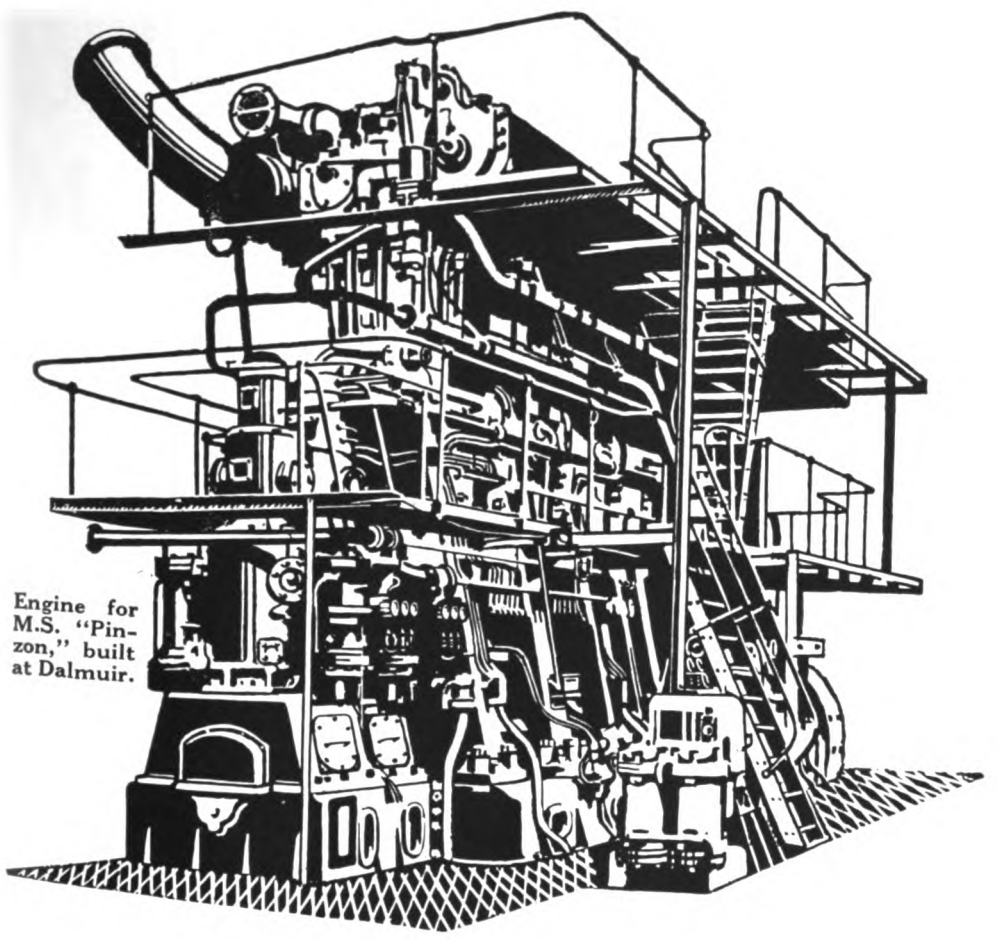
BEARDMORE-TOSI DIESEL *Marine Engine*



Engine for M.S. "Pinzon," built at Dalmuir.

THE ENGINE THAT REPRESENTS THE GREATEST ADVANCE IN DESIGN AND IN MARINE PROPULSION

Results of 100 Hours' Trial.

Average B.H.P.	**1,276**
Mechanical efficiency, per cent.	**77**
Average I.H.P.	**1,646**
Revolutions per minute	**124**
Mean pressure on B.H.P. basis, lb. per square inch	**75.5**
Fuel consumption, lb. per P.H.P. per hour	**.42**
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	**4.5**
Exhaust temperature, average at exit from exhaust valve, deg. Fah.	**550**
Lubricating oil pressure, lb. per square inch	**10-12**
Circulating water pressure (jacket), lb. per square inch	**10-15**
Piston cooling water pressure, lb. per square inch	**20-30**
Water temperature at outlet from cylinder heads, deg. Fah., average.	**125**
Piston cooling water, outlet temperature, deg. Fah., average	**130**
Blast air pressure, lb. per square inch	**1,000**

Extract from THE ENGINEER, November 11th, 1921.

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

Full particulars from the builders—

WILLIAM
BEARDMORE
AND COMPANY LIMITED

NAVAL CONSTRUCTION WORKS: DALMUIR, SCOTLAND.
LONDON OFFICE: 36 VICTORIA ST. S.W.1.

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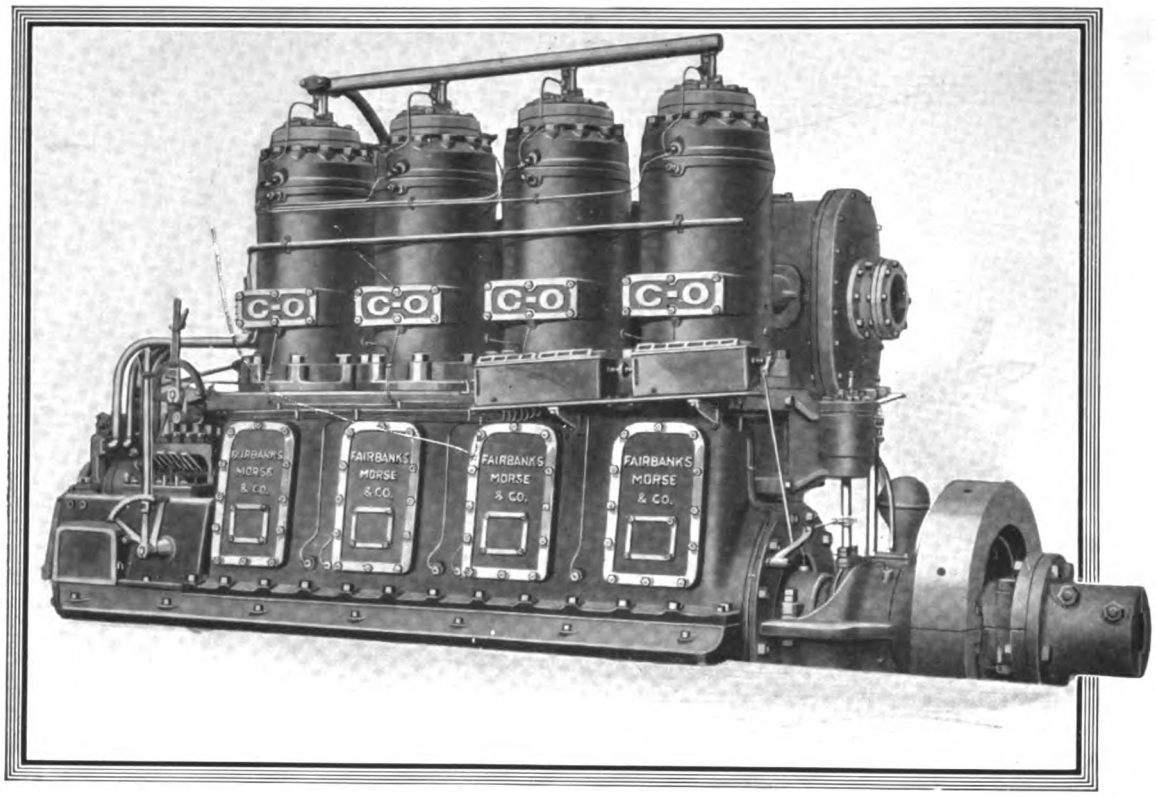
Fairbanks-Morse "C-O" Marine Oil Engines



Profit Producers for Work-boat Owners

By actual comparison of fuel and maintenance costs "C-O" engines have been proven both practical and economical on work-boats of every description. They economically use low-priced fuel oils.

They are simple in design—sturdy in construction—easy to start—practically automatic in operation. They can be depended upon for power and flexibility in any weather.

Ask for full particulars about this practical work-boat power.

Fairbanks, Morse & Co.
MANUFACTURERS CHICAGO
The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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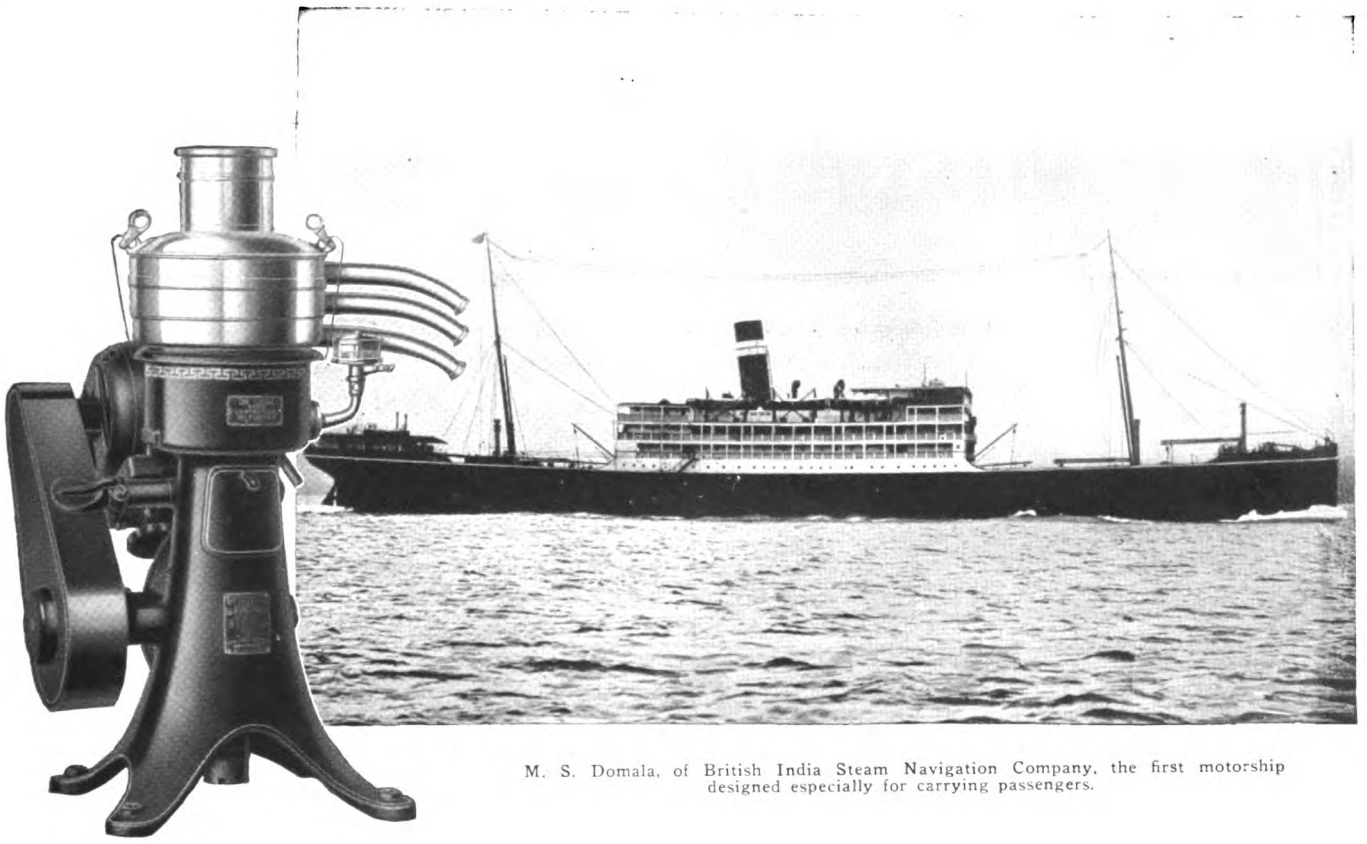

M. S. Domala, of British India Steam Navigation Company, the first motorship designed especially for carrying passengers.

De Laval Oil Purifier protects Diesels of M. S. Domala and lowers lubricating cost

A De Laval Oil Purifier operated in connection with the continuous by-pass system constantly maintains the efficiency of the oil used to lubricate the Domala's 4000 b.h.p. Diesels. It protects them against trouble and wear resulting from the use of dirty lubricating oil. At the same time, it greatly reduces lubricating cost by making it possible to keep the oil in service until it is finally lost by decomposition or leakage. No oil need ever be removed from the system.

Oil returned from the bearings is constantly by-passed to the Purifier, in which water, carbon and other dirt are centrifuged out. The purified oil discharged from the machine then goes back into the lubricating system with its original qualities restored.

That is, in brief, the system which on about 1000 ships is protecting turbines, Diesels and to some extent reciprocators, and economizing on the use of oil. The attached coupon brings further information as to how De Laval Oil Purifiers will work for you. Mail it.

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway Chicago, 29 East Madison St.

Manufacturers' Selling Agents, De Laval Pacific Company, San Francisco, Cal.
Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a

De Laval

Please send Bulletins telling how the operation of ships' engines can be improved and lower lubricating costs obtained, with particular reference to the type of engine checked.

☐ Turbine ☐ Diesel

Name.....

Company.....

Address.....

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UNITED AMERICAN LINES
INCORPORATED

Managing Agents: American-Hawaiian Steamship Co.
American Ship and Commerce Corporation

General Agents: Hamburg-American Line

Hamburg

Joint Services with

Hamburg-American Line

From New York, Boston, Philadelphia, Baltimore, Norfolk and New Orleans

Through bills of lading, via Hamburg, to all Baltic and Scandinavian Ports

Dutch East Indies

U. S. Government Ships

New York to Penang, Belawan-Deli, Port Swettenham, Singapore, Batavia, Samarang and Soerabaya

Steamers take cargo for Tunis, Alexandria and Syrian Coast Ports

Intercoastal Service

of the

American-Hawaiian S. S. Co.

New York, Boston and Philadelphia to Los Angeles, San Francisco, Portland, Seattle and Tacoma

Through bills of lading, via Los Angeles to San Diego, via San Francisco, to Oakland, Stockton, Sacramento, California; and to Honolulu, Iloilo, Kahului and Port Allen, Hawaiian Islands

Pacific Coast to Europe

Service of the

American-Hawaiian S. S. Co.

U. S. Pacific Coast Ports
to the
Principal Ports of the United Kingdom and Continent
Direct Fortnightly Sailings

Telephone: Whitehall 1020

General Offices: 39 BROADWAY, New York

Cable Address: "Unamline, N. Y."

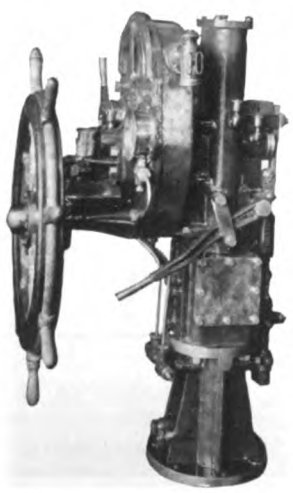
BRANCH OFFICES

BOSTON—40 Central Street
CHICAGO—327 So. La Salle Street
CLEVELAND—242 The Arcade
PHILADELPHIA—Bourse Building
PITTSBURG—Oliver Building
ROCHESTER—Commerce Building

General Pacific Coast Agents: Williams, Dimond & Co., 310 Sansome St., San Francisco

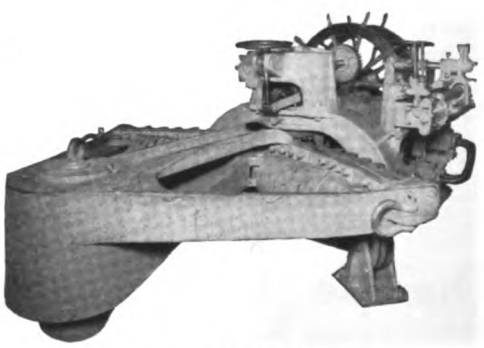
CUNNINGHAM
ELECTRIC AUXILIARY MACHINERY

The Pioneer American Line of Electric Deck Machinery



The "CUNNINGHAM" geared spring quadrant type electric-hydraulic steering gear (KENNICOTT TYPE) controlled by our MACTAGGART-SCOTT safety steering TELEMOTOR, is the IDEAL STEERING GEAR for MOTORSHIPS.

The floating quadrant driving the tiller through compression springs, provides a thoroughly resilient connection with the rudder. The hydraulic variative power and speed transmission gear gives maximum speed and control of the rudder at ordinary helm angles and maximum torque at hardover positions without overloading the electric motor, which runs continuously.



PATENTS PENDING

Steering Gears—Windlasses—Winches—Capstans—For Motorships

ALLAN CUNNINGHAM CO., Inc.

NEW YORK
Maritime Engineering & Sales Corp.
2 Rector St., New York City, N. Y.
Telephone Rector 2318

MAIN OFFICE AND WORKS
7500 Carleton Avenue
Seattle, Wash.

SAN FRANCISCO
Geo. E. Swett
201 Rialto Bldg.
San Francisco, California

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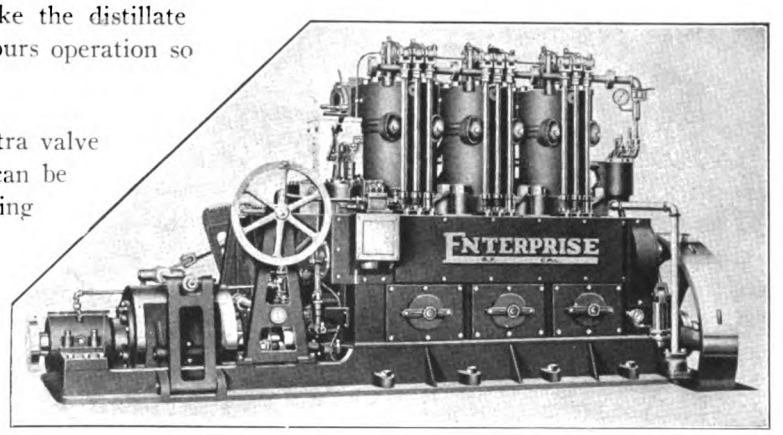
"Valves In Cages" Insure Steady Continuous Operation For Enterprise Diesels

One of the many exclusive features upon which Enterprise Diesels have built a name for efficiency and economy.

ENGINES that have valves in the cylinder head, like the distillate engines, require the boat to be laid up after 400 hours operation so that the valves can be taken out and ground.

This is not necessary with Enterprise Diesels for an extra valve can be inserted in five minutes. The valve taken out can be reground and replaced whenever desired without delaying the boat at all.

This is only one of the many exclusive features that Enterprise Diesels possess over ordinary Diesels. We shall be glad to explain *personally* special and exclusive features if you are interested.



Northern Distributors:
H. G. McLAUGHLIN CO.
809 Railroad Ave.
Seattle, Washington

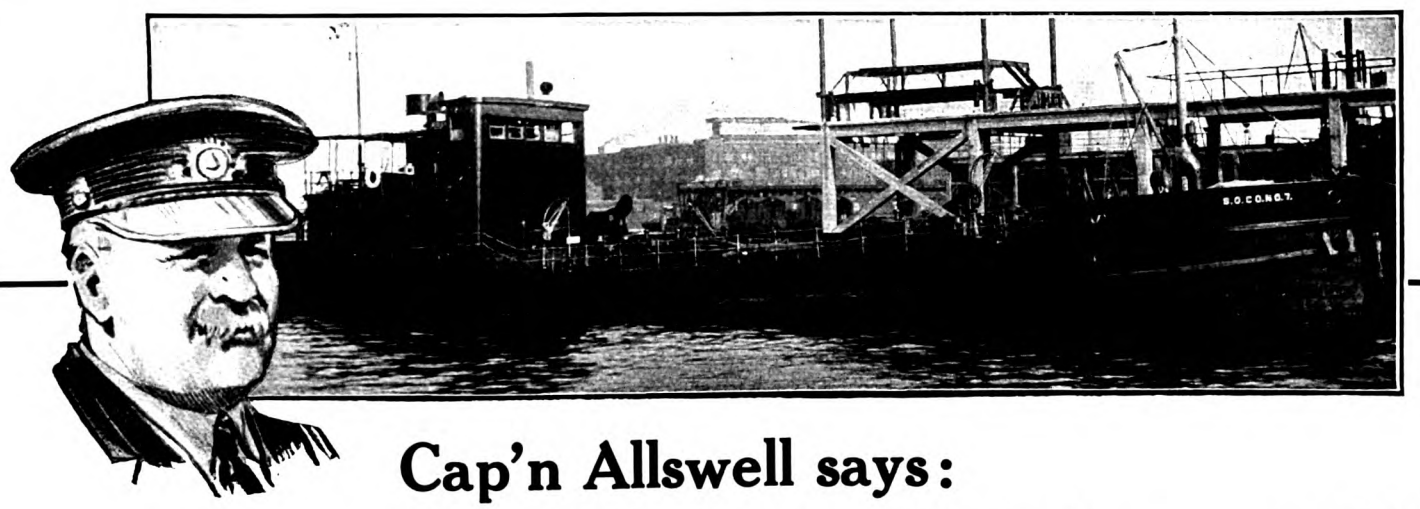
Southern California:
GAERTNER & KELLY
San Pedro, Cal.

ENTERPRISE ENGINE COMPANY
Eighteenth and Alabama Sts., San Francisco, Cal.

Eastern Distributors:
SEXTON MOTOR CO.
30 Church Street
New York, N. Y.

Southern Distributors:
MENGE MARINE HARDWARE & SUPPLY CO.
New Orleans, La.

British Columbia Distributors: VANCOUVER SHIPYARDS, Ltd., Vancouver, B. C.



Cap'n Allswell says:

"It's a wise boat that knows its own speed!"

Take this Socony Barge No. 7. She's a 145-footer, draws 6½ feet of water, and holds 250 tons. She's powered with a couple of 200 horse Wintons turning around 400.

Her job is to make a big string of oil and gas stations every day and *do it on time.* So, to get the full power of her wonderful engines, they fitted her out with 58″ Columbian Bronze Propellers.

Specifications called for 8 knots. Did she ante up? You bet she did, and nearly a full knot more—provin' that a good engine and good wheel make a mighty spirited team, providin' the wheel's a Columbian."

Send for Columbian Literature

COLUMBIAN *Bronze* PROPELLERS

THE COLUMBIAN BRONZE CORP., 218 N. Main St., Freeport, N. Y. *N. Y. C. Sales Only: 44 Third Ave.*

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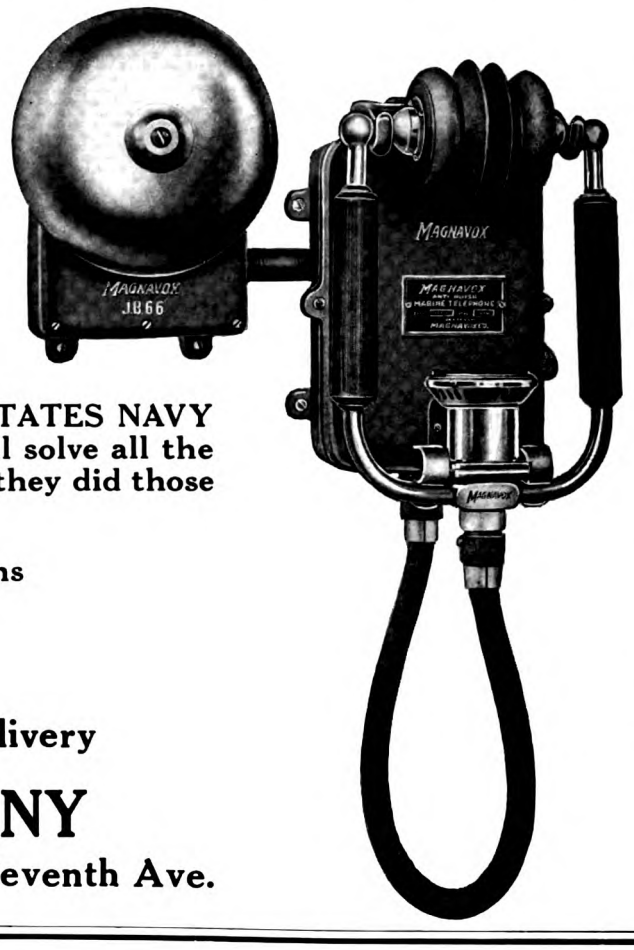
PERFECT COMMUNICATION

BY TELEPHONE

BETWEEN BRIDGE AND ENGINE ROOM NO MATTER HOW NOISY



MAGNAVOX ANTI-NOISE Marine telephone systems supersede all other forms of communication for marine use. They operate faithfully under the most severe noise conditions and are standard equipment on 270 UNITED STATES NAVY Destroyers and on hundreds of merchant vessels. They will solve all the communication problems of MOTORSHIPS just as well as they did those of steam driven vessels. Watertight of course.

They can be supplied up to and including 10 stations

What are your requirements?

We will gladly quote you for immediate delivery

THE MAGNAVOX COMPANY

Oakland, California New York Office, 370 Seventh Ave.

DEUTSCHE WERFT
HAMBURG

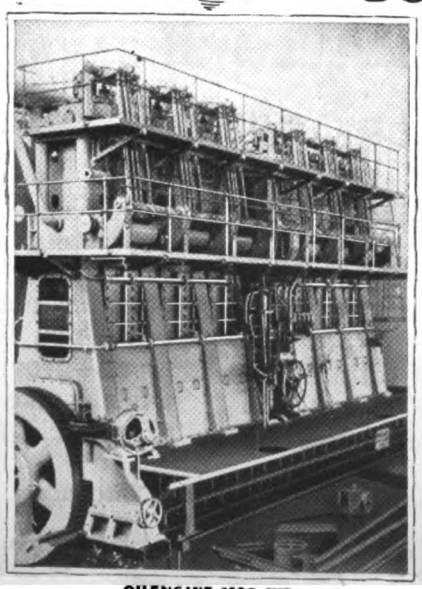
CABLE ADRESS: DEUTSCHWERFT HAMBURG

TELEPHONE: VULKAN 6300-6309 HAMBURG

DW

7000 WORKMEN · 19 BERTHS FOR SHIPS UP TO A LENGTH OF 820 FEET · ANNUAL OUTPUT 200000 TONS TONNAGE

STEAM-AND MOTOR SHIPS · CARGO STEAMERS-CAPACITY OF 2000, 4000, 6500, 8000, 10000 AND 14000 TONS · TANK STEAMERS-CAPACITY OF 3700, 8000, 10000 AND 12000 TONS · FLOATING DOCKS UP TO THE LARGEST DIMENSIONS · TRAWLERS AND LIGHTERS



OILENGINE 1550 IHP
LICENSEES OF BURMEISTER AND WAIN OILENGINES FOR GERMANY AND ITALY.

SHIPBUILDING · DOCK CONSTRUKTION · ENGINEERING WORKS · BOILER MAKING · REPAIRS · FLOATING DOCKS OF 4000 AND 8000 TONS CAPACITY

VERTICAL STEAM ENGINES · OILENGINES · STEAM TURBINES · LICENSEES OF BURMEISTER AND WAIN OILENGINES FOR GERMANY AND ITALY-TYPES 1550, 2250, 3100 IHP · BOILER FOR SHIPS AND STATIONARY PURPOSES WITH FORCED DRAUGHT AND SUPERHEATERS · LOKOMOTIVES

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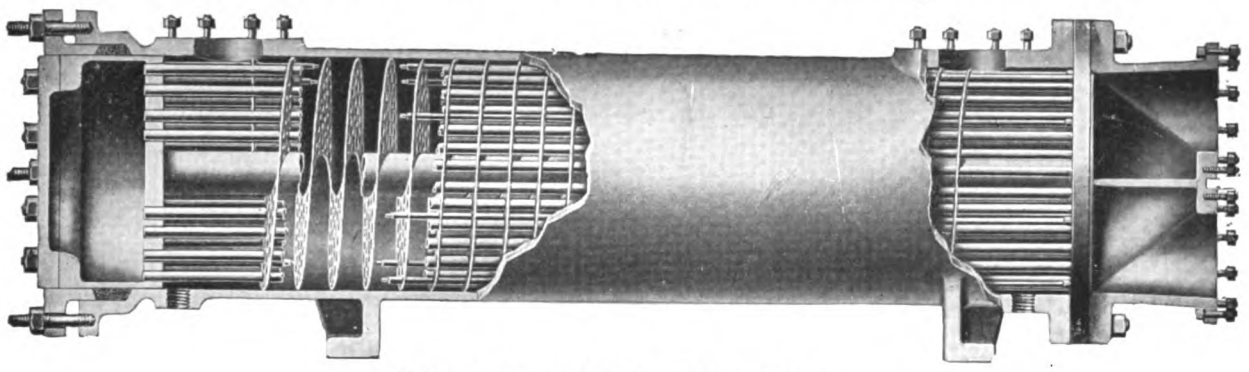
Do Your Diesel Engine Bearings Run Cool at Heavy Loads?

Multiwhirl Coolers are extensively used for cooling Diesel lubricating oil.



Multiwhirl Cooler

The oil is directed in its flow through the shell by the helical baffle and gives up its heat to the circulating water in the copper tubes.

The shell is bored throughout to insure against foundry scale or sand contaminating the oil.

Bulletin No. 904 tells the complete story. It's yours for the asking.

THE GRISCOM-RUSSELL CO.

2154 West Street Building, New York

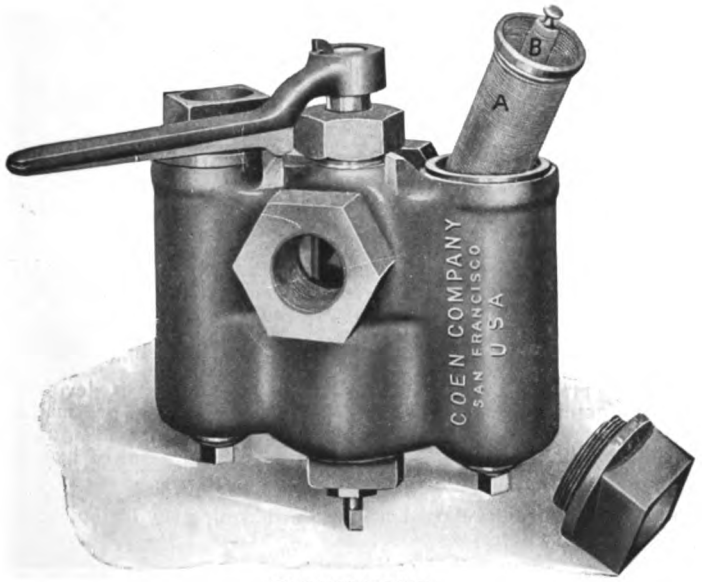
Philadelphia, Boston, Hartford, Rochester, Pittsburgh, Cleveland, Toledo, Detroit, Chicago, Syracuse, Minneapolis, St. Louis, New Orleans, Salt Lake City, Denver, Houston, Fort Worth, Charlotte, San Francisco, Seattle, Los Angeles, Kansas City, Milwaukee

REG. U.S. PAT. OFF.

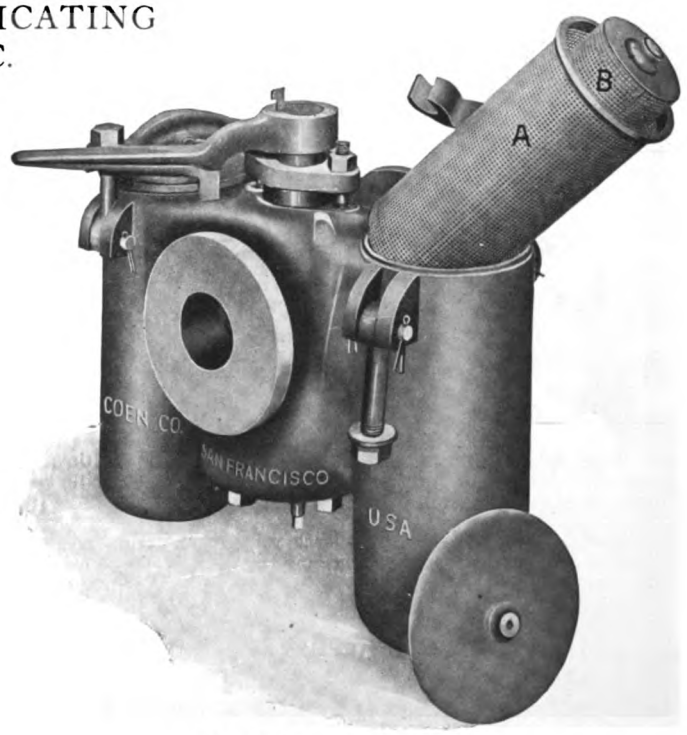
"COEN" DUPLEX STRAINER

FOR

FUEL AND LUBRICATING OILS, ETC.



DISCHARGE



SUCTION

COEN COMPANY, Inc.

OIL BURNING SPECIALISTS

EXECUTIVE OFFICES:
SAN FRANCISCO

SEATTLE OFFICE
115 Grand Trunk Dock

PORTLAND OFFICE
51 First Street

NEW YORK OFFICE
50 Church Street

PHILADELPHIA OFFICE
303 Finance Building

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MR. ENGINEER!

Have you ever realized that the proper operation of the engines of your vessel depends chiefly on the quality of lubricating-oil used and its ability to provide and maintain that protecting film between the metallic surfaces so essential to efficient and economic service?

The slightest breakdown in your machinery during a voyage, due to the poor quality of lubricating-oil, with resultant delays and unnecessary repairs, will many times exceed the entire annual cost of lubrication.

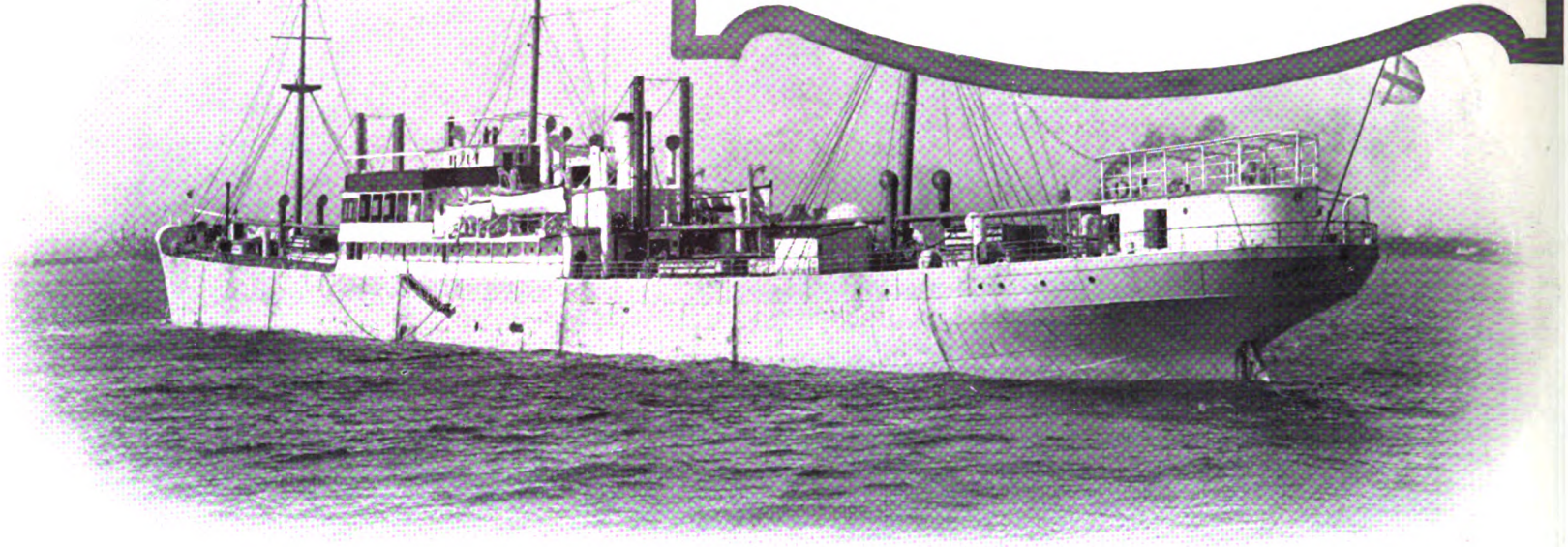
WICO DIESEL-ENGINE OILS

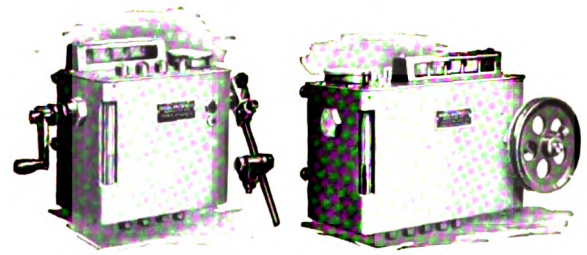
are of superior quality, provide every safeguard and guaranteed to reduce friction to a minimum.

Stocks carried at ALL West Indian, Central and South American Ports

WEST INDIA OIL COMPANY

W I C O MARK





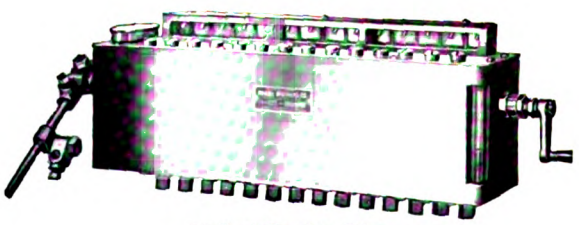
4 Feed Ratchet Oiler 5 Feed Rotary Oiler

"Manzel" Oilers are made in sizes and styles to fit any engine.

They can be furnished with any number of feeds; with rotary, ratchet, or direct lever drive; large or small reservoirs; polished brass or painted finish.

There is a Manzel Oiler to meet your requirements no matter how large or small your engine may be.

Write for Catalogue



14 Feed Ratchet Oiler

"Manzel" Force Feed Oilers

Manzel Oilers are designed to lubricate the cylinders and bearings of Diesel and other heavy-duty engines in the most positive and economical way.

They are the result of more than twenty years experience in the manufacture of Force Feed Oilers.

Simple in design, but strong and durable, they supply the oil in just the right quantity where and when it is needed.

Each feed is regulated independently, and may be adjusted to supply the exact amount of oil required, no matter how much or little is needed.

The feed is always in sight, enabling the operator to see at all times exactly how much oil is being supplied to each cylinder or bearing.

Manzel Oilers are built in the largest plant in the world that is devoted entirely to the manufacture of Force Feed Oiling Devices. They are made by experts who have made a specialty of Force Feed Oilers since 1898, and who understand the requirements necessary for effective lubrication of heavy duty engines.

Manzel Force Feed Oilers are used as standard equipment by builders of the better engines everywhere.

Let us quote on your requirements

Manzel Brothers Company

300-302 Babcock St., Buffalo, N. Y., U.S.A.

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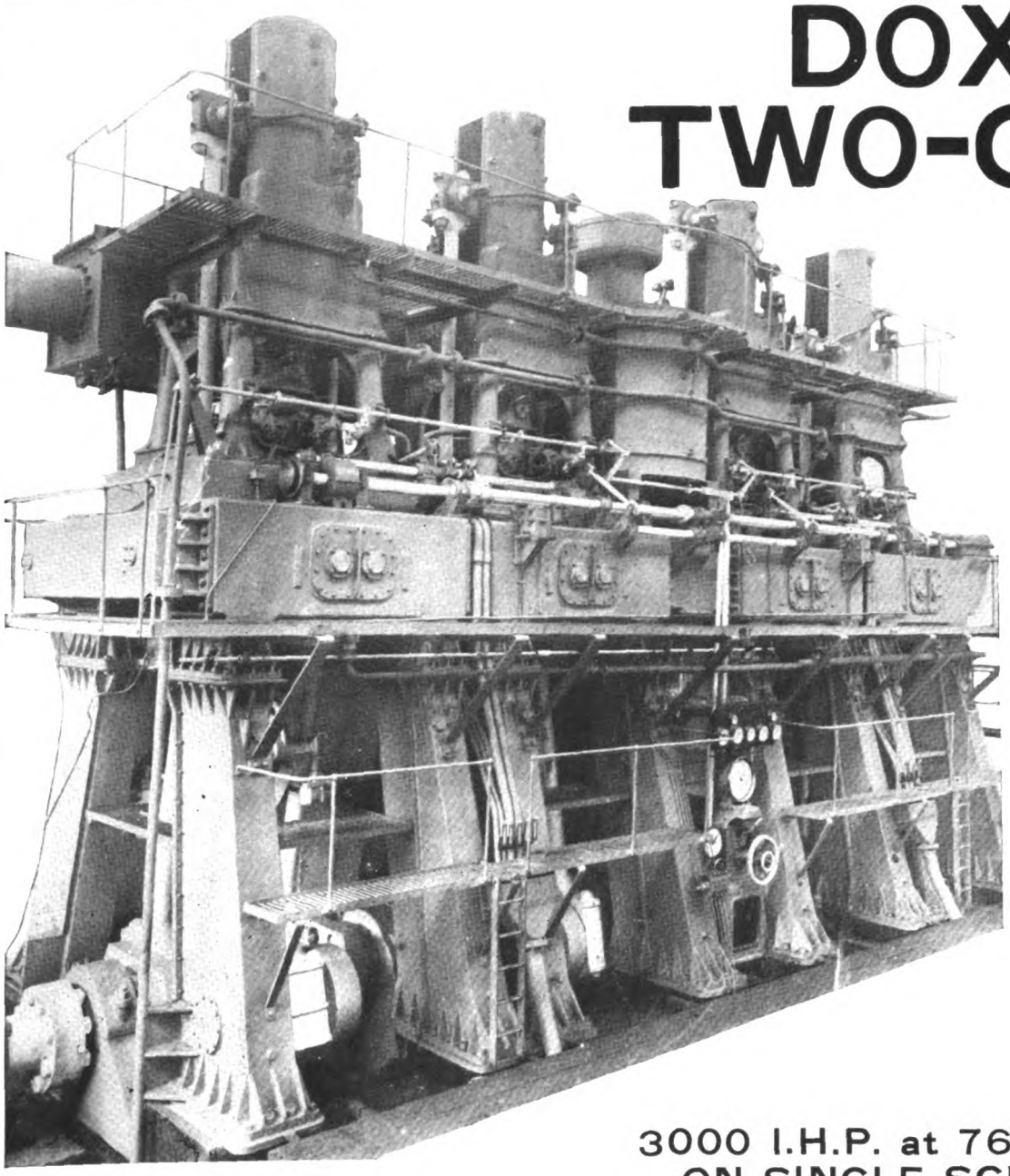
SUN SHIPB
DIESEL

BUILDERS OF ALL
TYPES OF VESSELS

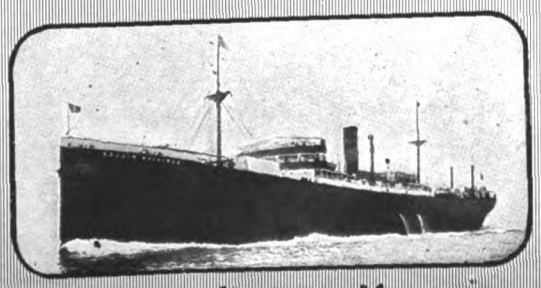
BUILDERS AND

DOXFORD
TWO-CYCLE



3000 I.H.P. at 76 R.P.M.
ON SINGLE SCREW

DOXFORD AND



MOTORSHIP "DOMINION MILLER"

PHILADELPHIA OFFICE
FINANCE BUILDING

MAIN OFFICE
CHESTER

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McINTOSH & SEYMOUR CORPORATION

AUBURN, N. Y., U. S. A.

Have Furnished Heavy-Duty Diesel Marine Engines for the Following Ships

Name of Vessel	Dead Weight Tonnage
CETHANA	3300
ISLA DE JAVA	4100
CHALLAMBA	3300
CULBURRA	3300
COCHINCHINE	2500
BAYONNE	1500
COOLCHA	3300
SOLITAIRE	5000
BENOWA	4400
BALCATTA	4400
BABINDA	4400
BOOBYALLA	4400
BORRIKA	4400
MARYLAND	4500
TEXACO No. 146	1000
TEXACO No. 147	1000
J. F. PENROSE	4500
BRAMELL POINT	5000
ASTMAHCO No. 3	3000
ASTMAHCO No. 4	3000
BACOI	2500
CAROLYN FRANCES	1000
DONNA LANE	3300
KENNECOTT	6500

LOOK UP THESE VESSELS WHEN THEY ARE IN PORT

MAIN OFFICE AND WORKS

AUBURN, N. Y., U. S. A.

149 BROADWAY
New York City

700 INTERSTATE BLDG.
Kansas City, Mo.

815 SHELDON BLDG.
San Francisco, Calif.

412 DALLAS COUNTY STATE BANK BLDG.
Dallas, Texas

412 BISBEE BLDG.
Jacksonville, Fla.

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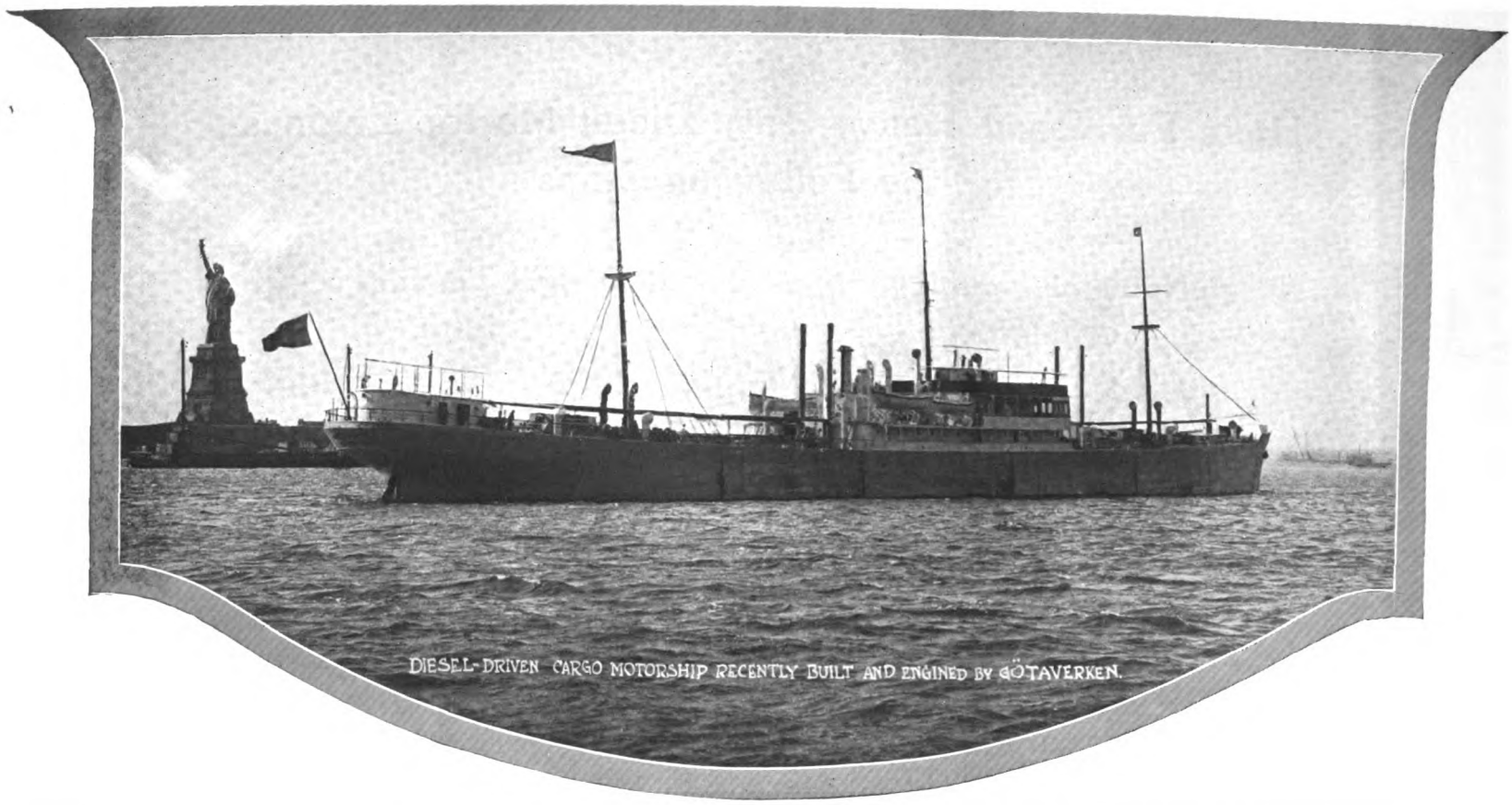
GÖTAVERKEN

GÖTEBORG—SWEDEN



DIESEL-DRIVEN CARGO MOTORSHIP RECENTLY BUILT AND ENGINED BY GÖTAVERKEN.

SHIPBUILDERS, ENGINEERS AND SPECIALISTS IN THE REPAIR OF MOTORSHIPS, STEAMSHIPS AND THEIR RESPECTIVE MACHINERY

TWELVE GÖTAVERKEN-BUILT MOTORSHIPS IN SERVICE, AGGREGATING 99,450 TONS D.W. AND 37,400 I.H.P., ALSO ONE DIESEL-DRIVEN SALVAGE-VESSEL OF 1,250 I.H.P. IF YOUR MOTORSHIPS NEED REPAIR IN EUROPEAN WATERS, SEND THEM TO OUR YARD IN PREFERENCE TO A PLANT THAT HAS HAD LITTLE OR NO EXPERIENCE WITH THE CONSTRUCTION OF HIGH-POWERED DIESEL-ENGINED MOTORSHIPS. WE HAVE BUILT SUCCESSFUL STEEL MOTORSHIPS OF LARGE SIZE UP TO 14 KNOTS SPEED. OUR LARGE FOUNDRY CAN SUPPLY DIESEL-ENGINE CASTINGS TO ORDER.

CONSTRUCTIONAL LICENSEES IN SWEDEN OF THE BURMEISTER & WAIN DIESEL MARINE OIL-ENGINE

DIESEL ENGINE WORKS

SHIPYARD—FOUNDRY

FLOATING DRY-DOCK WITH A LIFTING CAPACITY OF 12,000 TONS

POSTAL AND TELEGRAPHIC ADDRESS

GÖTAVERKEN GÖTEBORG

Note—Owing to the engravings and "copy" for the third of the Götaverken's series of "MOTORSHIP PERFORMANCE" advertisements not having arrived up to the time of closing for press, we were obliged to substitute the above "copy." The engravings were shipped by the S. S. "Drottingholm" on Aug. 5th but were delayed in transit.

The Manager "MOTORSHIP"

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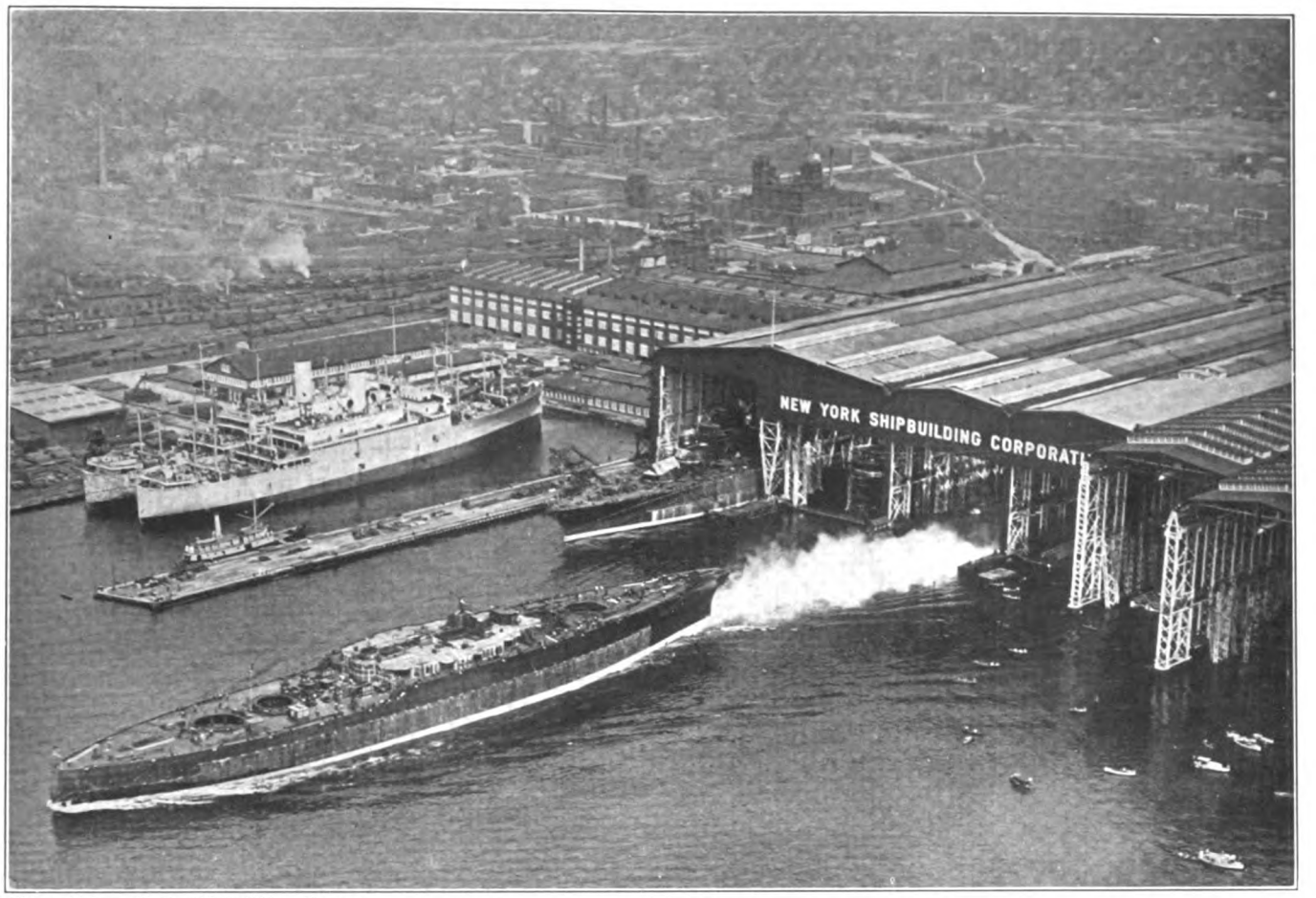


Photo. © New York Shipbuilding Corp.

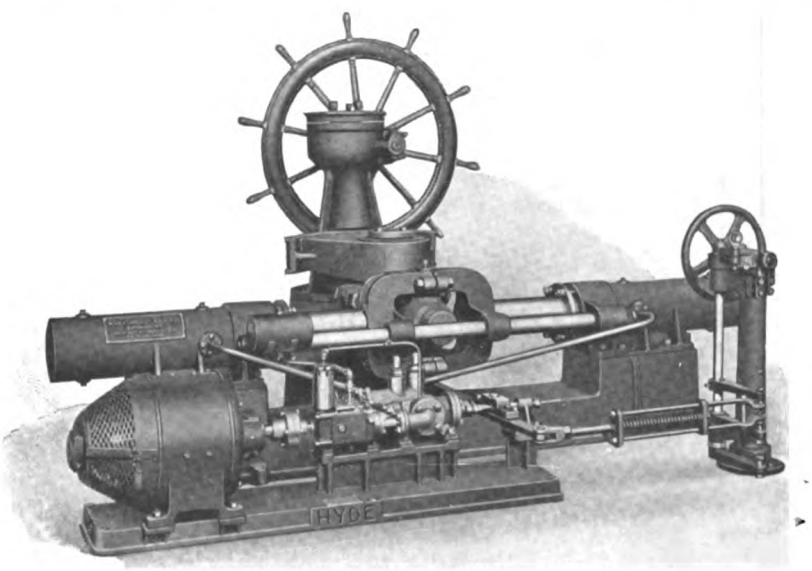
NEW YORK SHIPBUILDING CORPORATION

MAIN OFFICE AND WORKS

CAMDEN, NEW JERSEY, U. S. A.

HYDE WINDLASS COMPANY - Bath, Maine

High grade marine auxiliary machinery and manganese bronze propellers



Hydro-electric Steering Gear

Hydro-electric Steering-gears, electric-windlasses, electric-winches, electric-capstans for motorships a specialty

When ordering specify "HYDE"

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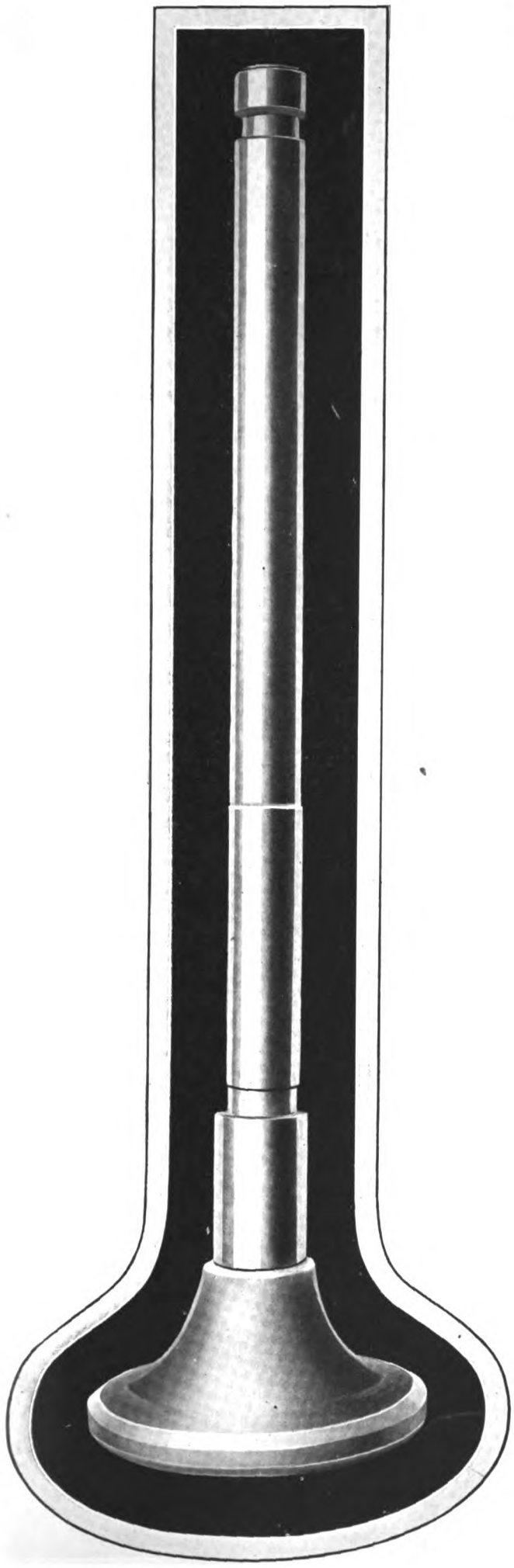

Nichrome

TRADE MARK REG. U. S. PAT. OFF.

The Long-Life

VALVES

IF you know how much valve grinding and valve replacements are costing you—in time, in labor, in lost power and in cost of new valves—then you know the economy value of Nichrome valves.

Nichrome Valves are practically immune to pitting. The Alloy, "Nichrome", does not carbonize; neither does carbon adhere to it.

Regrinding is therefore seldom required; replacements almost never—even when the service is unusually severe and the fuel of a highly destructive nature.

PROOF—the best proof in the world—is a Nichrome* Valve in service in *your* Diesel engines.

* Nichrome is the registered trade-mark name applying solely to alloys made by the Driver-Harris Company.

DRIVER-HARRIS COMPANY
HARRISON, NEW JERSEY
Chicago - Detroit - Canada - England - France

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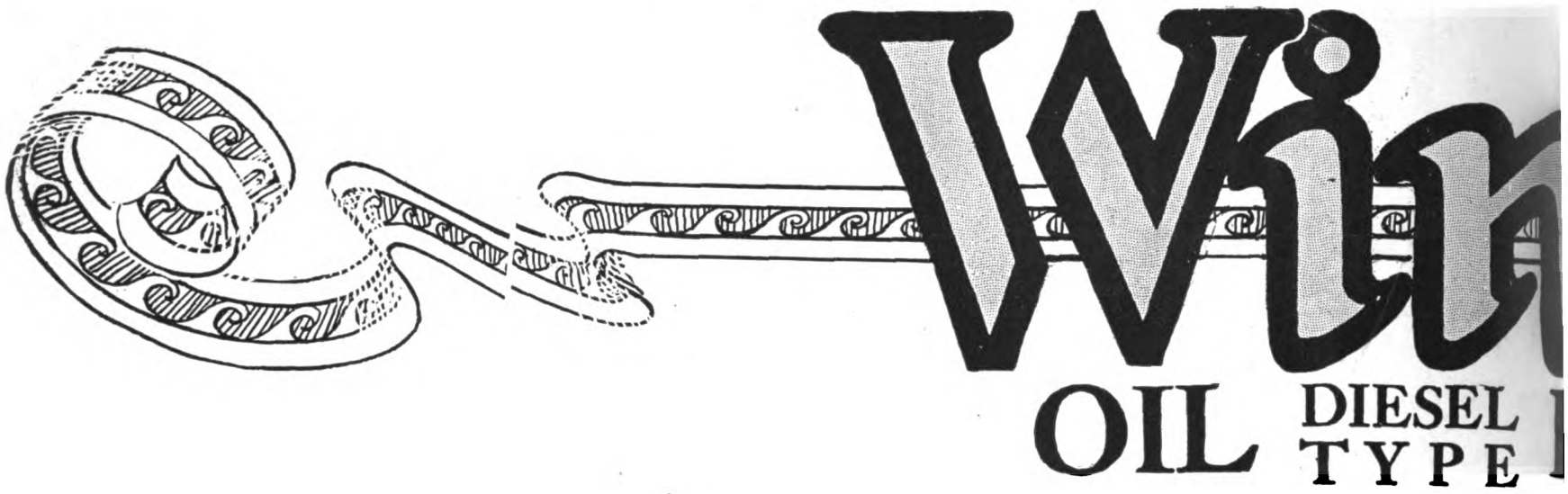


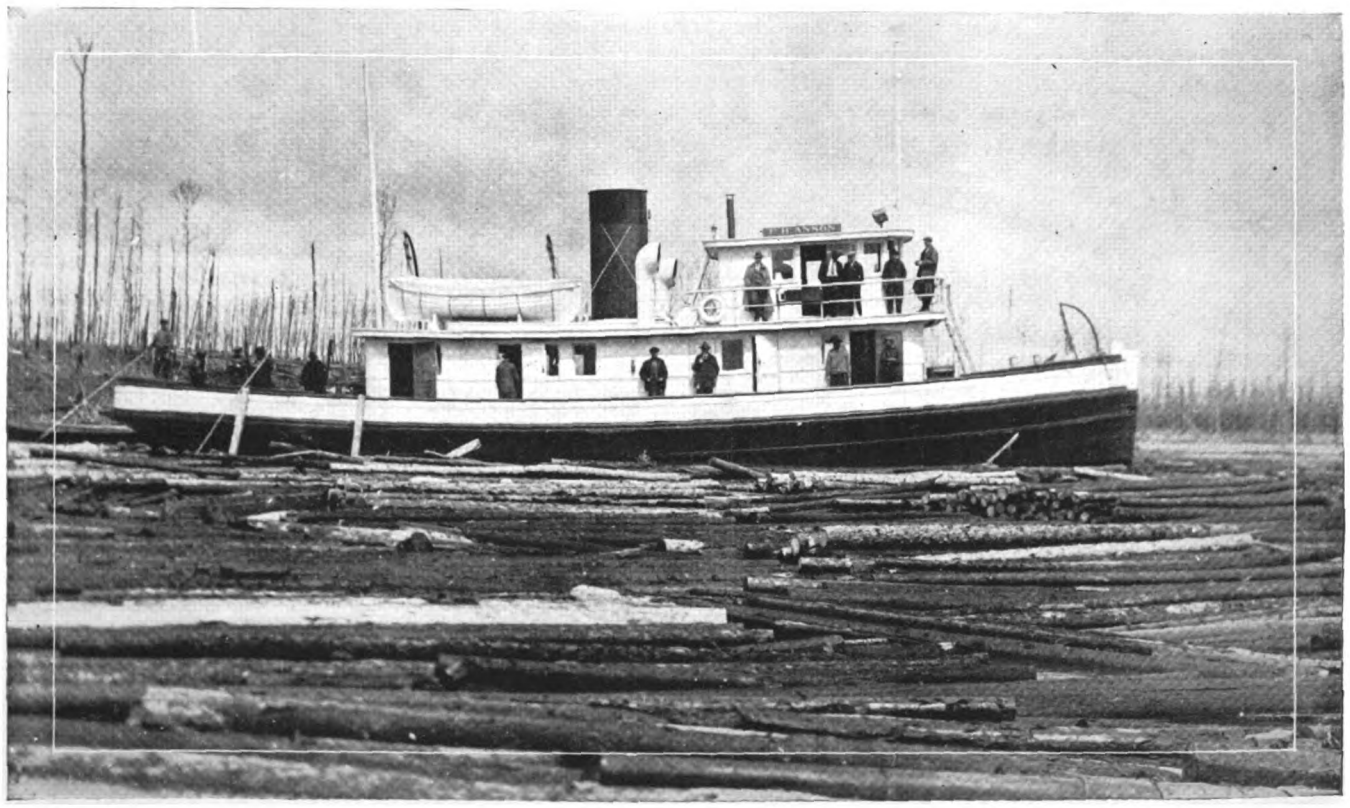
An 80-Foot Tow Boat with 350 H. P. Winton Diesel Engine

The "F. H. Anson" is an 83′x20′6″x9′5″ Tow Boat designed by Ralph E. Winslow, N.A., for the Abitibi Power & Paper Company for use on the Abitibi River in Canada, towing booms of pulpwood.

Power plant consists of a six cylinder 350 H.P. Direct Reversible Winton Diesel Oil Engine and an auxiliary three cylinder Winton Air Compressor.

This Tow Boat is now doing the work formerly done by **four** smaller steam tugs and, in her first six days of operation, delivered more logs into the booms than all four steamers together did in ten days.

Economical operation, economical maintenance, 10-day fuel capacity, steady day-in and day-out dependability—all these tend to make the Diesel-Engine driven Tug the work boat of the future.



WINTON ENGINE WORKS,

New York—A. G. Griese, Inc., 30 Church St. ***Seattle***—H. W. Starrett, Sunset Engine Co.
Washington, D. C.—R. L. Fryer, 817 Albee Bldg.

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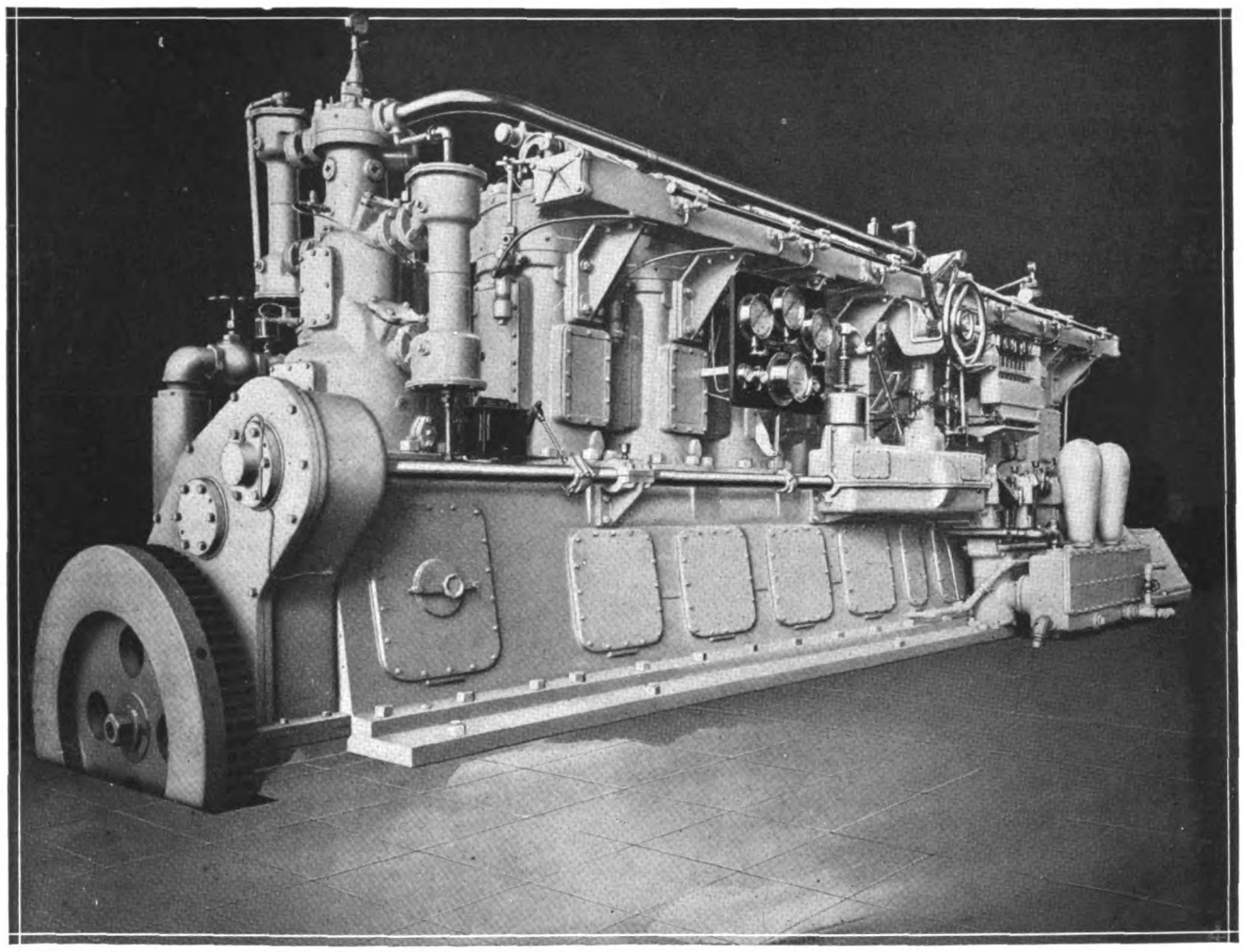
ton ENGINES



The Power Plant in the "F. H. Anson"

CLEVELAND, OHIO, U. S. A.

Los Angeles, Cal.—F. G. Bryant, 704 Delta Bldg.

New Orleans, La.—A. Baldwin Company

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WERKSPOOR I

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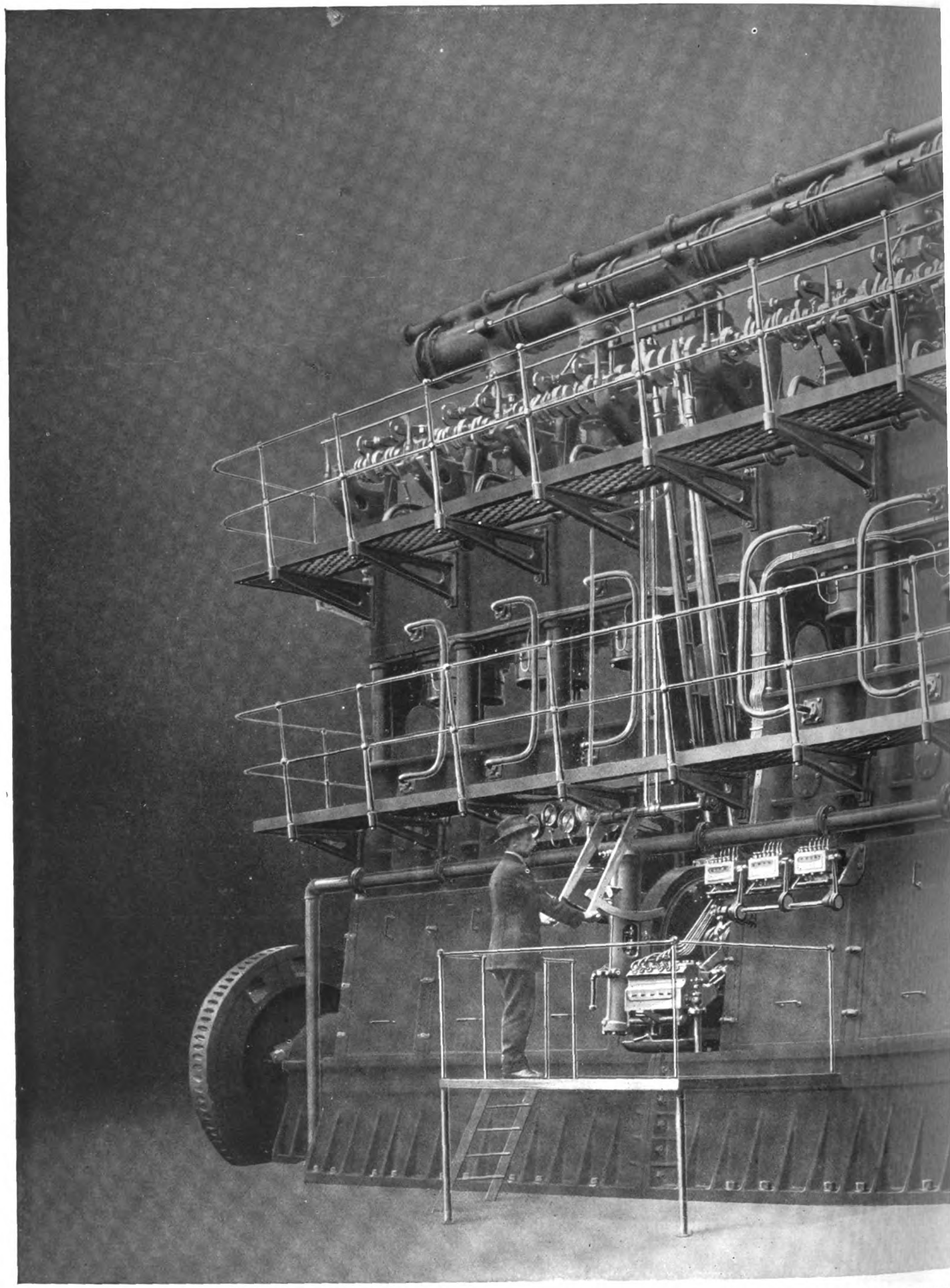

ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INSTA

PACIFIC DIESEL

OAKLAND,

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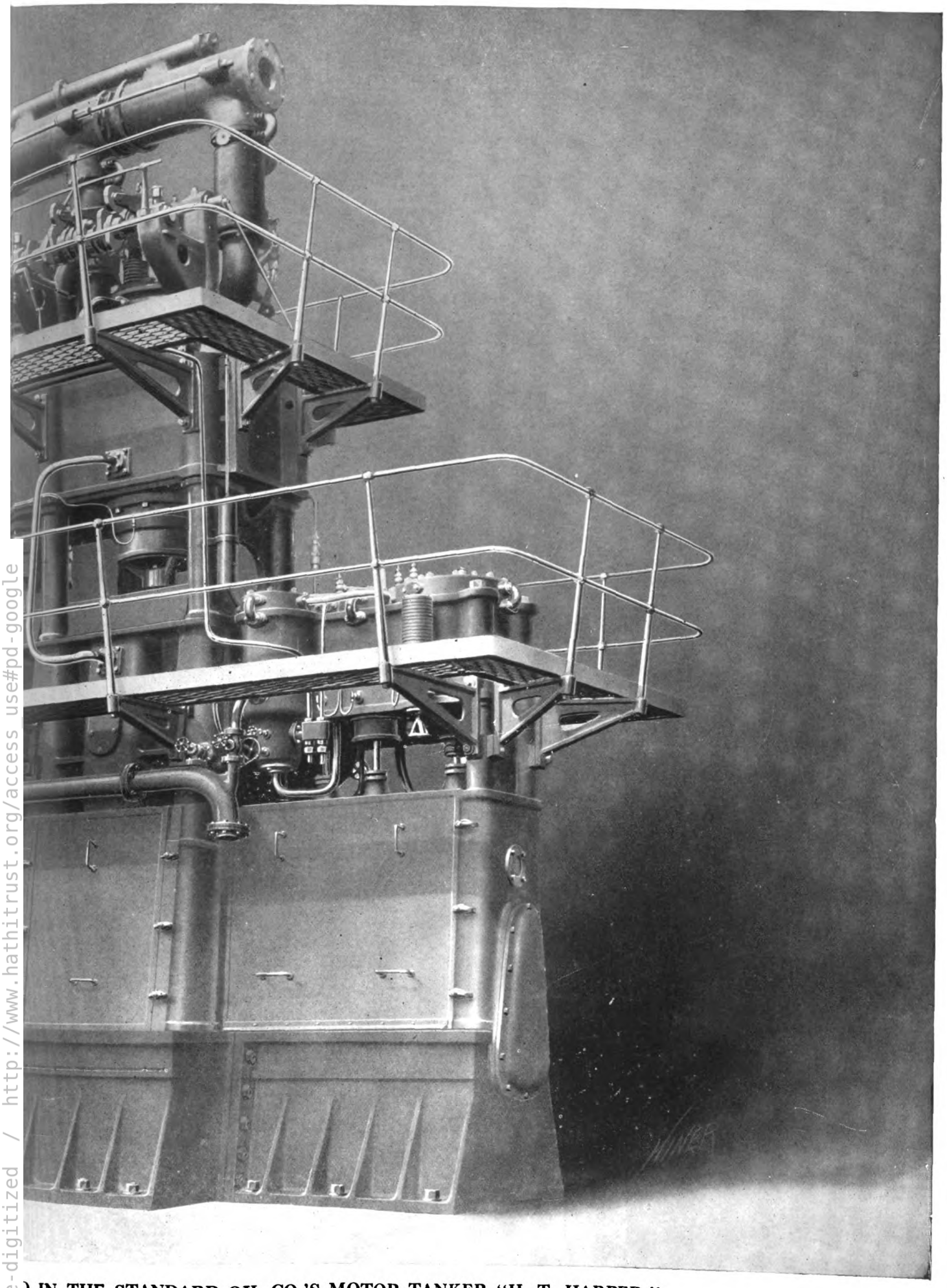
DIESEL ENGINES



) IN THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

NGINE COMPANY

ALIFORNIA

RELIABILITY

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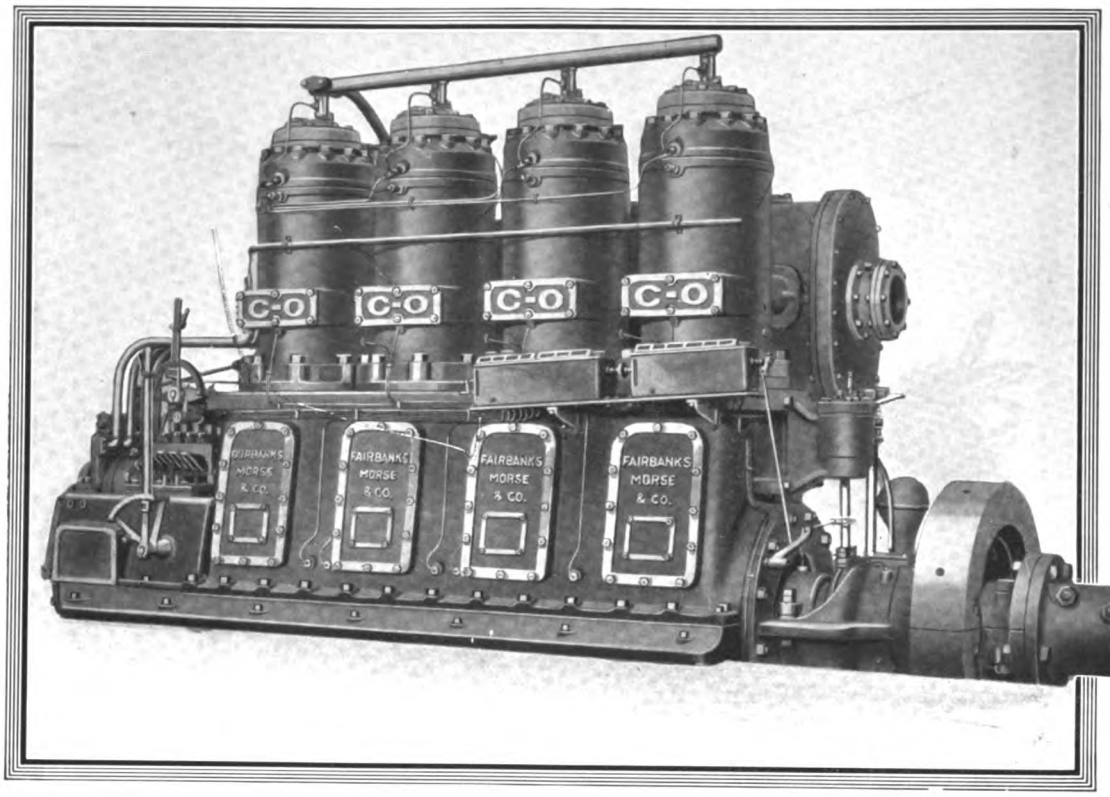
Fairbanks-Morse "C-O" Marine Oil Engines



Profit Producers for Work-boat Owners

By actual comparison of fuel and maintenance costs "C-O" engines have been proven both practical and economical on work-boats of every description. They economically use low-priced fuel oils.

They are simple in design—sturdy in construction—easy to start—practically automatic in operation. They can be depended upon for power and flexibility in any weather.

Ask for full particulars about this practical work-boat power.

Fairbanks, Morse & Co.
MANUFACTURERS CHICAGO
The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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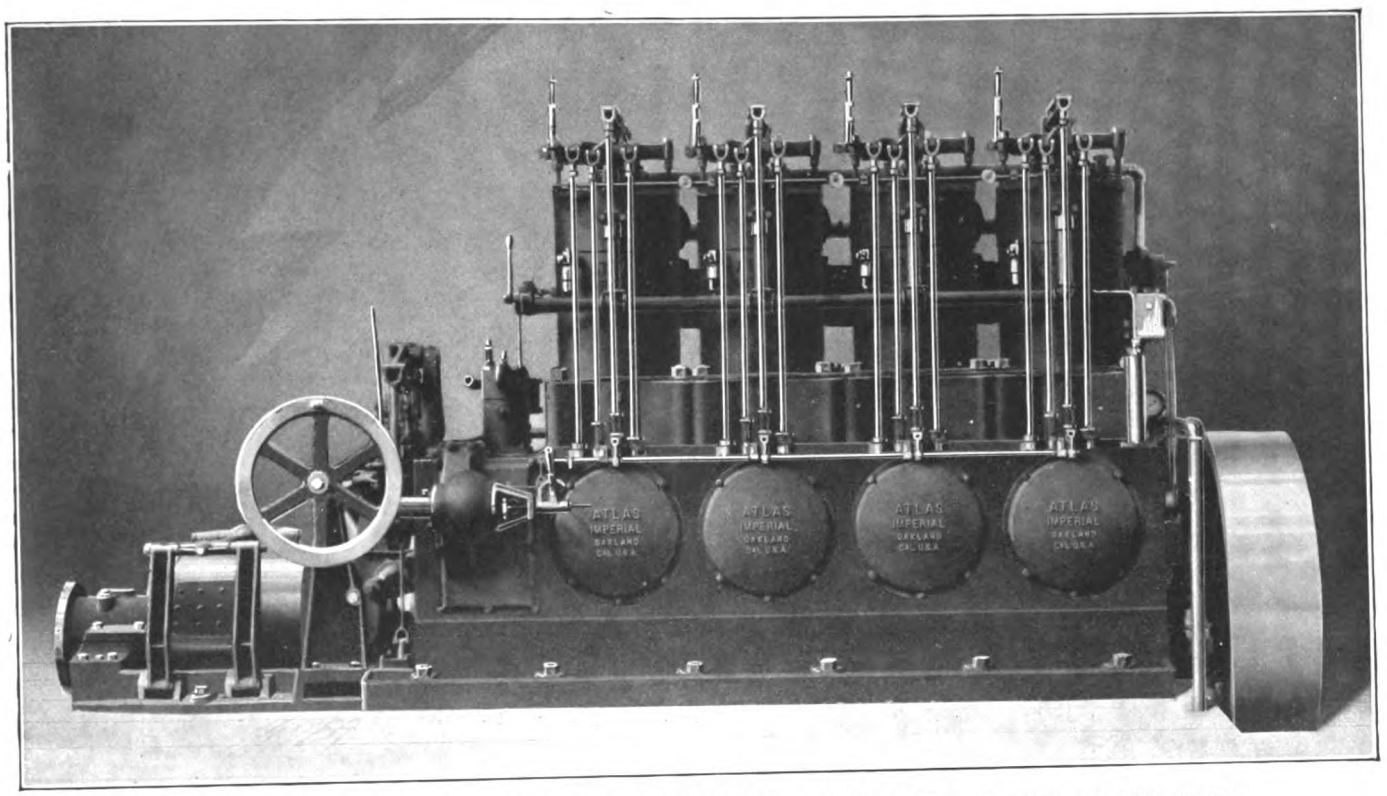
ATLAS-IMPERIAL



165 H. P. MECHANICAL-INJECTION MARINE DIESEL-ENGINE
BUILT IN 3, 4 and 6 CYLINDER TYPES 55 TO 500 HORSE-POWER

SOME CHARACTERISTICS OF OUR ENGINES:

STARTING:	Is accomplished by compressed-air at 30 to 150 lbs. pressure in 5 to 10 seconds from stone cold to full power.
FUEL INJECTION:	Fuel-oil is injected into the combustion-chamber by mechanical means, no high-pressure air is used.
FUEL IGNITION:	Ignition is accomplished by the heat of compression only, no hot-balls, points, or surfaces of any kind are used.
COMPRESSION:	350 lbs. per square-inch.
FUEL CONSUMPTION:	One gallon of crude-oil for 19 horsepower per hour.
GRADE OF FUEL:	Any grade of fuel-oil is used that will flow readily through the pipes to the engine.
COST OF FUEL:	About 1/10 of a gas-engine.
LUBRICATION:	Return force-feed system to bearings through hollow crank-shaft and connecting-rod. Mechanical feed to cylinders. Consumption 1/10 gallon per 100 H. P. hour.
POWER:	Engines develop 20% in excess of rated power.
GOVERNING:	Gear-driven fly-ball governors regulate the quantity of fuel used, and sensitively controls the speed of the engine from no-load to full-load and vice versa with a variation in speed of not over 5%.
VIBRATION:	Less than a heavy-duty gas-engine.
RELIABILITY:	Absolutely dependable under the most trying conditions.
FLOOR SPACE:	About 15% greater than a heavy-duty gas-engine of same power.
WEIGHT:	Slightly greater than heavy-duty gas-engines of same power.
ACCESSIBILITY:	All parts are easy of access and made interchangeable as far as practical.
MATERIAL & WORKMANSHIP:	Are the highest possible standard for commercial purposes. All parts made from carefully selected material with a view of its special service, carefully machined to jigs and templates and ground and hardened where necessary.
SPEED:	Revolutions can be varied from 80 to 350 per minute.
SALES:	Our sales are rapidly increasing and every engine is giving wonderful service and satisfaction.

* *

Our Diesel engine in your boat will please you and make you money.

REPRESENTATIVES

ASTORIA, ORE.—Atlas-Imperial Engine Agency, 12th and Bond Sts.
HONOLULU, T. H.—H. A. Peterson, Box 155
JUNEAU, ALASKA—Charles G. Warner Company
NEW ORLEANS, LA.—J. G. Davis, 1324 Music St.
NOME, ALASKA—Alaska Lighterage and Commercial Co.
PAPETTE, TAHITI—Et Davio
SAN PEDRO, CAL.—Garbutt & Walch
SEATTLE, WASH.—Atlas Gas Engine Agency, 901 Western Ave.
SUVA, FIJI—Morris Hedstrom, Ltd.
VANCOUVER, B. C.—Ferrier and Lucas

ATLAS IMPERIAL ENGINE COMPANY
OAKLAND, CALIFORNIA

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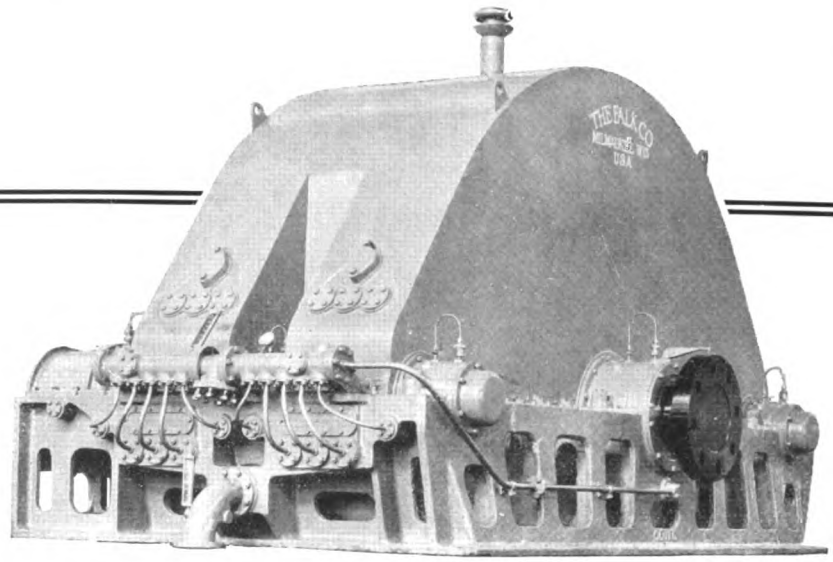

6000 S.H.P. Single Reduction Falk Herringbone Gear Unit for Compound Turbines. Speed 1900 to 132 R.P.M. Twin Screw Passenger Ship.

FALK
HERRINGBONE GEARS

Under the most severe conditions of marine service Falk Herringbone Gears have proved their superior efficiency and wearing qualities.

Falk Gears transmit power in a smooth, continuous flow, entirely free from backlash and from the sudden strains which cause undue wear on machinery. They are giving first class service on difficult transmission installations on both turbine and Diesel driven ships.

Years of practical experience in solving marine power transmission problems have gained for the Falk Corporation an enviable reputation in this field. This valuable experience is at your disposal at any time.

THE FALK CORPORATION
MILWAUKEE, WISCONSIN

REPRESENTATIVES
W. O. Beyer, 1007 Park Bldg., Pittsburgh, Pa.
M. P. Fillingham, 50 Church St., New York City.
F. W. Grimwood, Rialto Bldg., San Francisco, Cal.
Vulcan Iron Works, Wilkes-Barre, Pa.
Denver Engineering Works, Denver, Colo.

CANADIAN REPRESENTATIVE
Engineering Equipment Co., Ltd., 619-623 New Birks Bldg.
Montreal, Quebec, Canada.

FOREIGN REPRESENTATIVE
Gustav Melms, 3 Rue Taitbout, Paris.

Falk Herringbone Gears are hobbed on our special machines from solid steel blanks cast in our own foundry.

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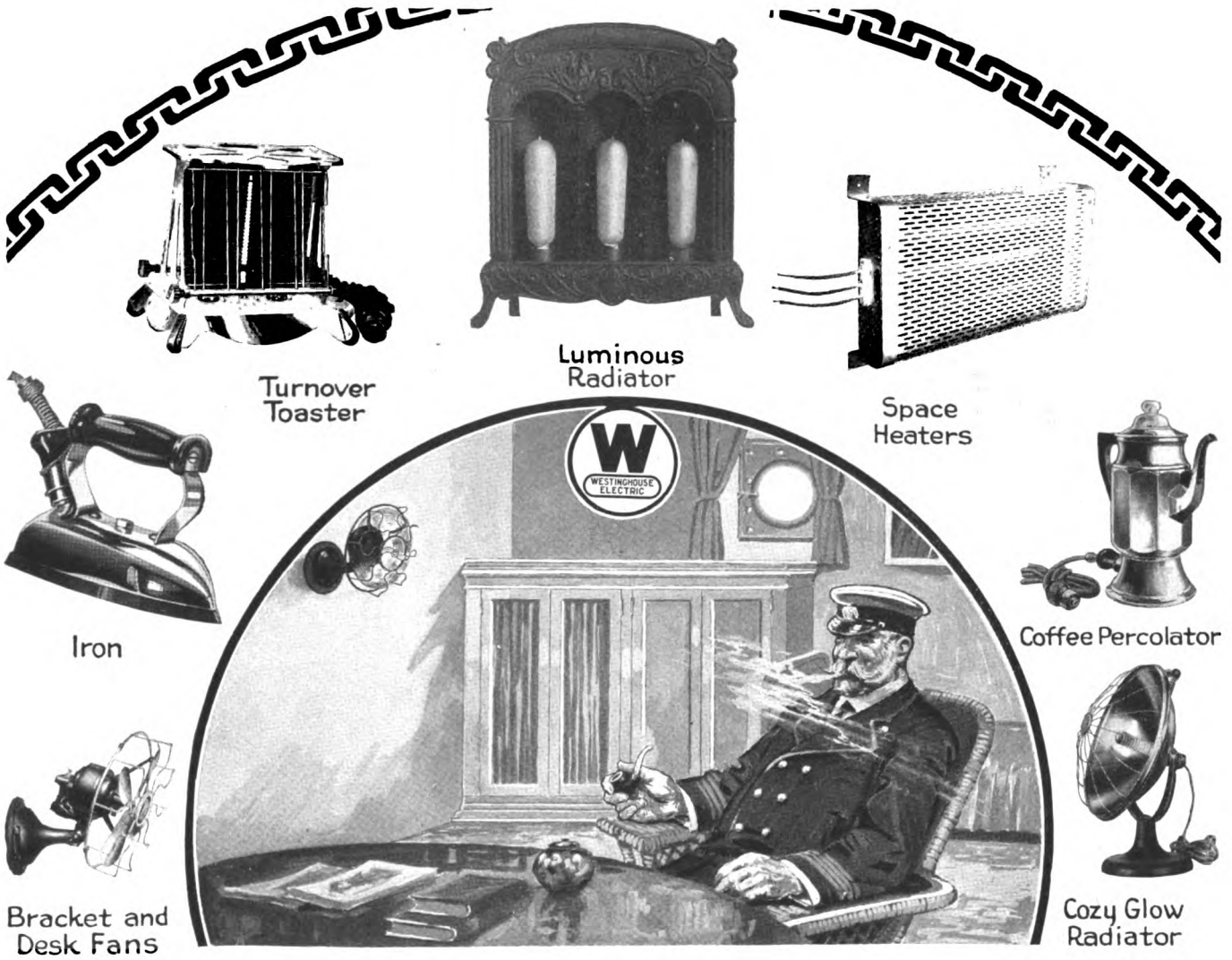

Home Comforts Aboard Ship

It is only necessary to compare the ship of today with the ship of yesterday to see the big advance that has been made in the matter of electrical conveniences on shipboard.

Electrical appliances that formerly were found only in the home have now come into common use not only on privately owned yachts and first class-passenger ships, but also on ships of all classes.

The ship today, like the home of today, is wired to permit of the use of the many electrical appliances that add to the comfort of the voyage.

Westinghouse Appliance Specialists will be glad to cooperate with shipbuilders and architects.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.
Sales Offices in All Principal American Cities
Special Pacific Coast Representatives, Hunt, Mirk & Company, San Francisco

Westinghouse

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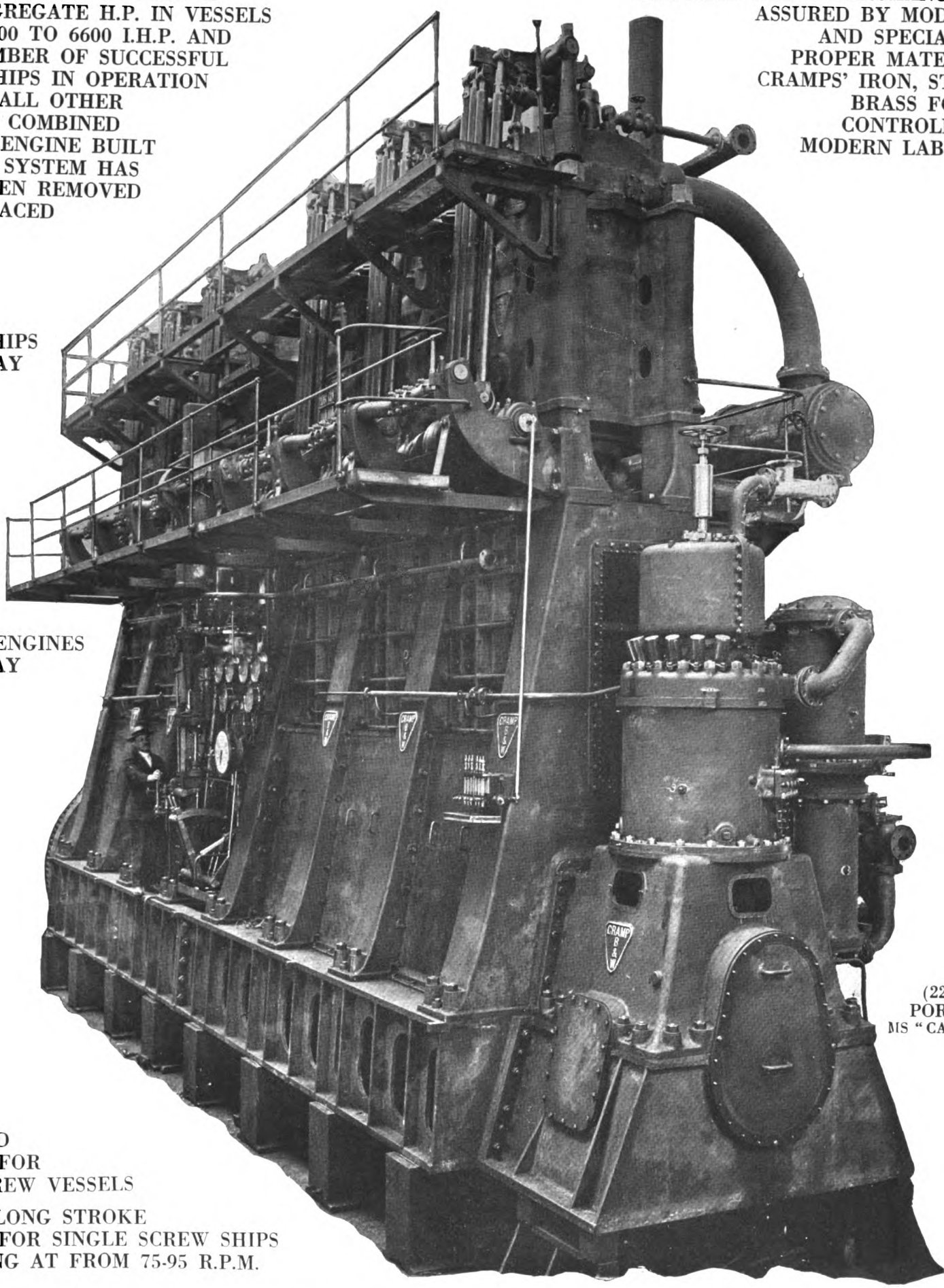
UNDER THE B. & W. SYSTEM THE AGGREGATE H.P. IN VESSELS FROM 1500 TO 6600 I.H.P. AND THE NUMBER OF SUCCESSFUL MOTORSHIPS IN OPERATION EXCEED ALL OTHER SYSTEMS COMBINED AND NO ENGINE BUILT TO THIS SYSTEM HAS EVER BEEN REMOVED OR REPLACED

ACCURACY AND INTERCHANGEABILITY ASSURED BY MODERN JIGS AND SPECIAL TOOLS; PROPER MATERIALS BY CRAMPS' IRON, STEEL AND BRASS FOUNDRIES CONTROLLED BY A MODERN LABORATORY

MOTORSHIPS THAT STAY ON THE SEAS

DIESEL ENGINES THAT STAY IN THE SHIPS



(2250 I.H.P.) PORT ENGINE MS "CALIFORNIAN"

STANDARD ENGINES FOR TWIN SCREW VESSELS

SPECIAL LONG STROKE ENGINES FOR SINGLE SCREW SHIPS OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE

(Burmeister & Wain System)

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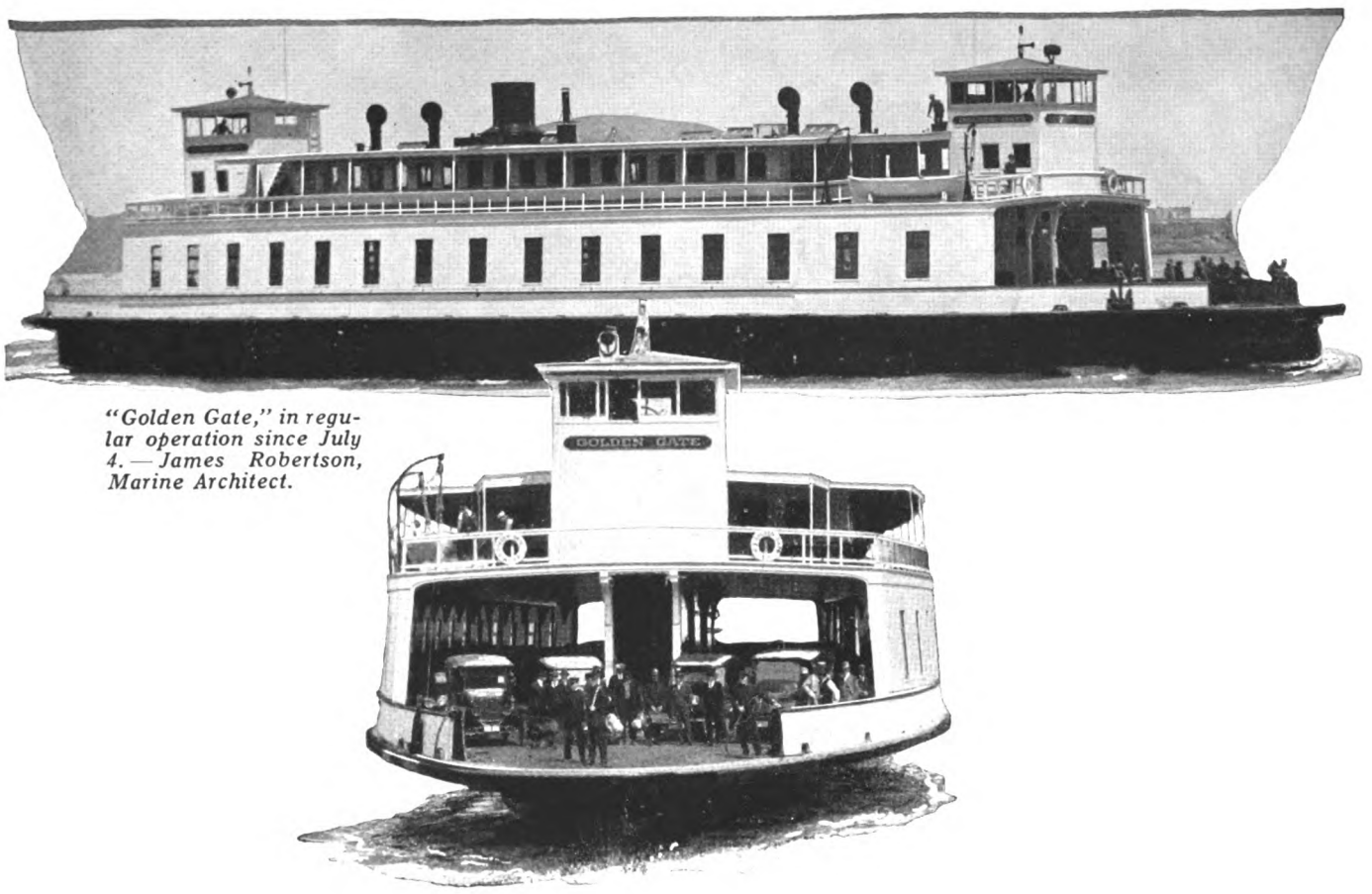
First Diesel Engine-Electric Drive Ferry



"Golden Gate," in regular operation since July 4. — James Robertson, Marine Architect.

Double-end Propulsion

Diesel Engine-Electric Drive was chosen for the "Golden Gate," the first double-end screw propeller ferry with each propeller driven independently.

Double-end propulsion is most economical when all the propelling power is concentrated on the aft propeller. Electric drive is the only means to accomplish this, using one prime mover for both directions of travel.

G-E Electric Drive for motor ships is available in any capacity required. Installations have already proved successful on ships regularly engaged in commercial fishing and cargo service.

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

30-32

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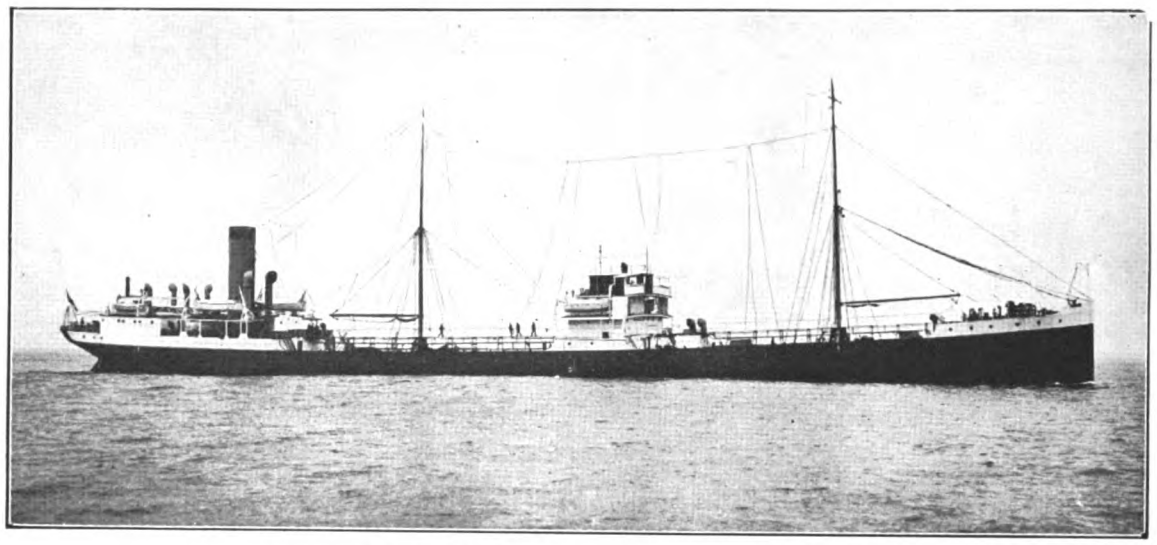
OIL FUEL

THE FUEL OF THE 20th CENTURY

Efficiency *Economy* *Cleanliness*



One of our Fleet of Oil-carrying Ships.

The Asiatic Petroleum Co., Ltd.

ST. HELEN'S COURT, GREAT ST. HELEN'S, LONDON, E. C. 3,

CAN ARRANGE SUPPLIES OF

OIL FUEL FOR MOTORSHIPS, STEAMERS' BUNKERS and INDUSTRIAL PURPOSES at

Adelaide
Alexandria
Amsterdam
Antwerp
Aomori
Avonmouth
Balboa (Panama Canal)
Balik Pappan
Bangkok
Barcelona
Barrow
Barton (Manchester Ship Canal)
Batavia
Bilbao
Boelebaai Ceram
Bombay
Buenos Ayres
Calcutta
Canton
Cape Town
Cebu
Christiania (Soon)
Colombo
Colon (Panama Canal)
Copenhagen
Curacao
Gemsah
Glasgow
Gothenburg
Granton
Hamburg
Hankow
Havana
Hong Kong
Hull
Hurghada
Iquique
Jarrow on Tyne
Karachi
La Guayra (Venezuela)
Las Palmas
Liverpool
Lisbon
London (Shellhaven & Thameshaven)
Macassar
Madras
Malmo
Malta
Manila
Maracaibo (Venezuela)
Marseilles
Melbourne
Miri
Mombasa
Montevideo
Montreal
Nagasaki
New Orleans
New York
Palembang
Pangkalan Berandan
Penang
Perim
Pernambuco
Piraeus
Portland (Oregon)
Port Said
Port Soudan
Pulo Bukom
Puloe Samboe
Rotterdam
Rouen
Rio de Janeiro
Sabang
Saigon
Saitozaki
Salina Cruz (Pacific)
San Francisco
San Pedro
Santos
Seattle (Washington)
Shanghai
Singapore
Soerabaya
Southampton
Stöckholm
Suez
Sydney
Svolvaer
Tampico
Tarakan
Trieste
Trinidad
Tuxpan
Vado
Valparaiso
Vancouver
Venice
Vera Cruz
Yokohama

And New Stations are expected to be ready shortly at

Antofagasta
Bordeaux
Constantinople
Dunkirk
Durban
Funchal (Madeira)
Havre
Ilo Ilo
Port Louis
Port St. Louis Du Rhone
San Juan (Porto Rico)
St. Vincent
St. Nazaire

BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company (New York), Limited, 233 Broadway, New York, N.Y., U.S.A.; The Shell Company, of California, Security Building, 343 Sansome Street, San Francisco, Cal., U. S. A.,** or at the above address.

THE Asiatic Petroleum Company also supply **Kerosene Oil** for use in the smaller Internal-combustion Engines and are prepared to supply **Petroleum Spirits, Lubricating Oils, Wax** and **Greases** in all Far Eastern Markets.

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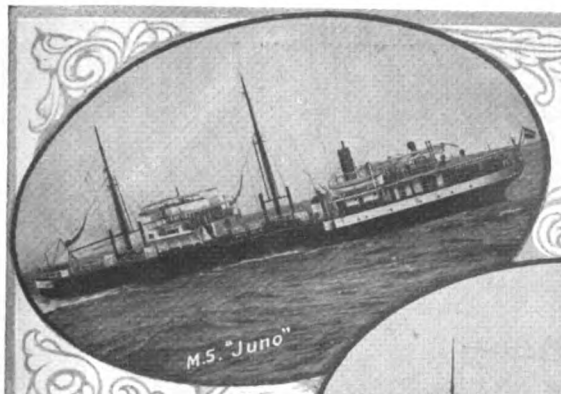
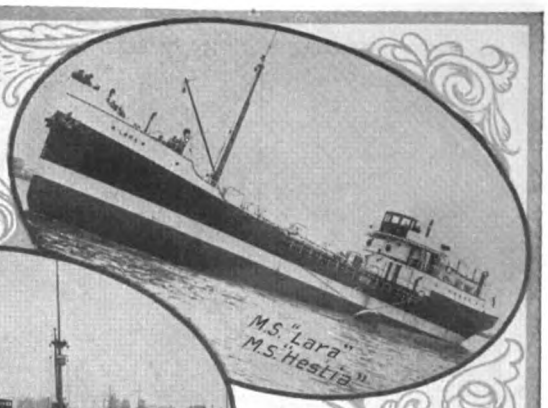
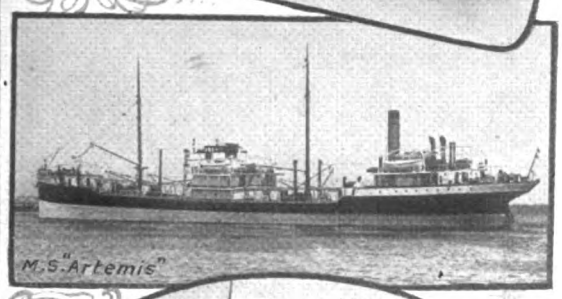
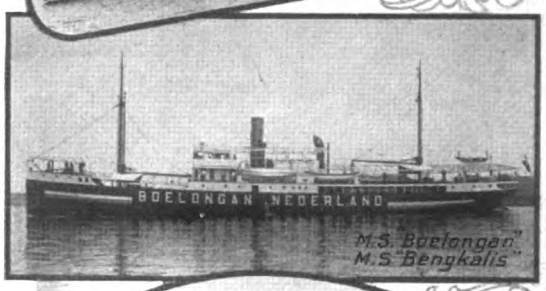
Some WERKSPOOR ENGINED MOTORSHIPS



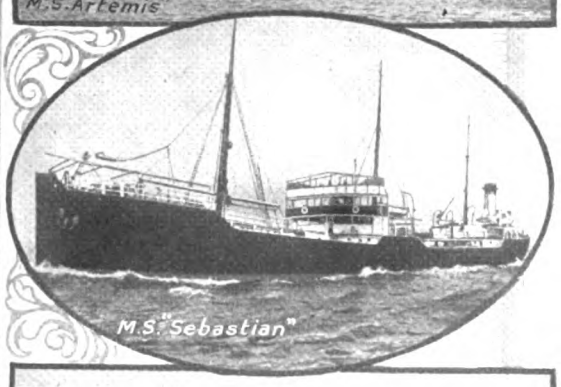


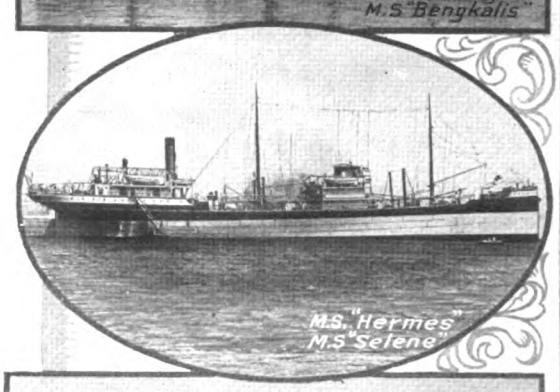




1910 to 1921

Name	Tonnage (Displacement)	Power (I.H.P.)
Juno	4370	1400
Jules Henry	4500	1350
Vulcanus	1845	650
Artemis	7725	2300
Sebastian	6900	2300
Sembilan	560	265
Loudon	3350	1400
Emanuel Nobel	9560	2800
Elbruz	9560	2800
Sardinia	5000	2140
Salerno	9700	2800
Myer	3350	1400
Siberg	3350	1400
Ares	7725	2300
Athene	9700	2800
Lara	1575	700
Hestia	1575	700
San Paulo	9700	2800
Boelongan	1640	700
Benkalis	1640	700
Hermes	7725	2300
Selene	7725	2300
Tosca	9700	2800
San Miguel	4050	1400
Geisha	9700	2800



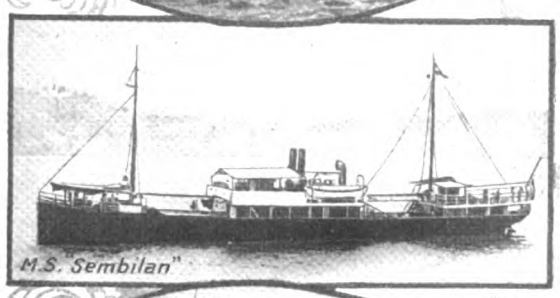


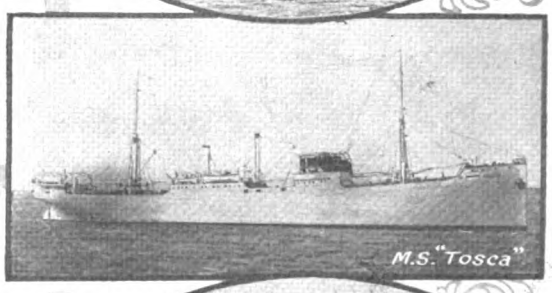
FOUR-CYCLE DIESEL ENGINES

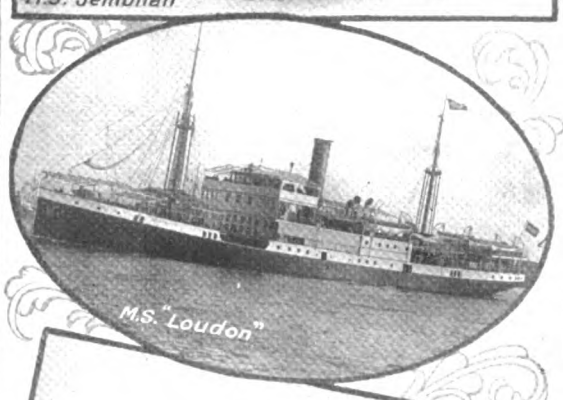
WERKSPOOR

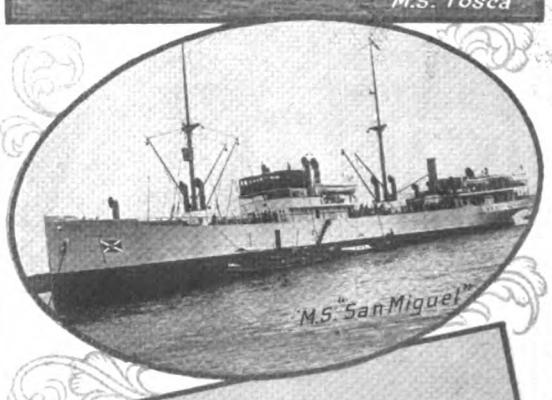
AMSTERDAM - - HOLLAND

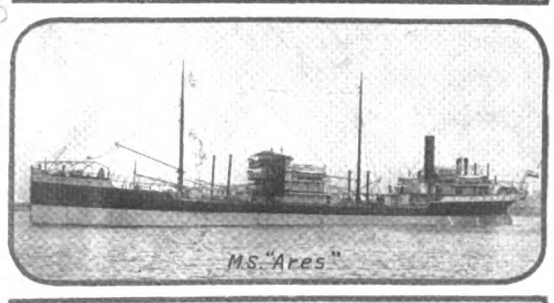
U. S. Representative:
WM. BRAAT
901 Woolworth Bldg., N. Y. City

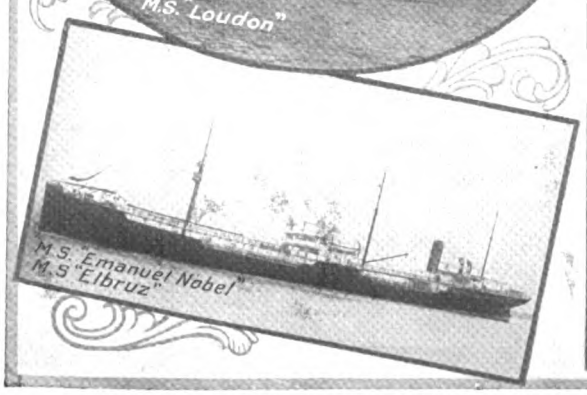


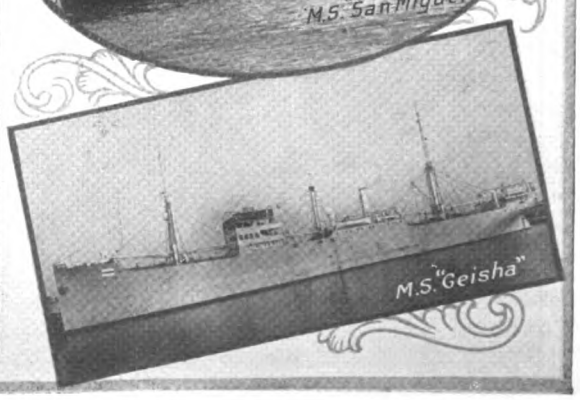












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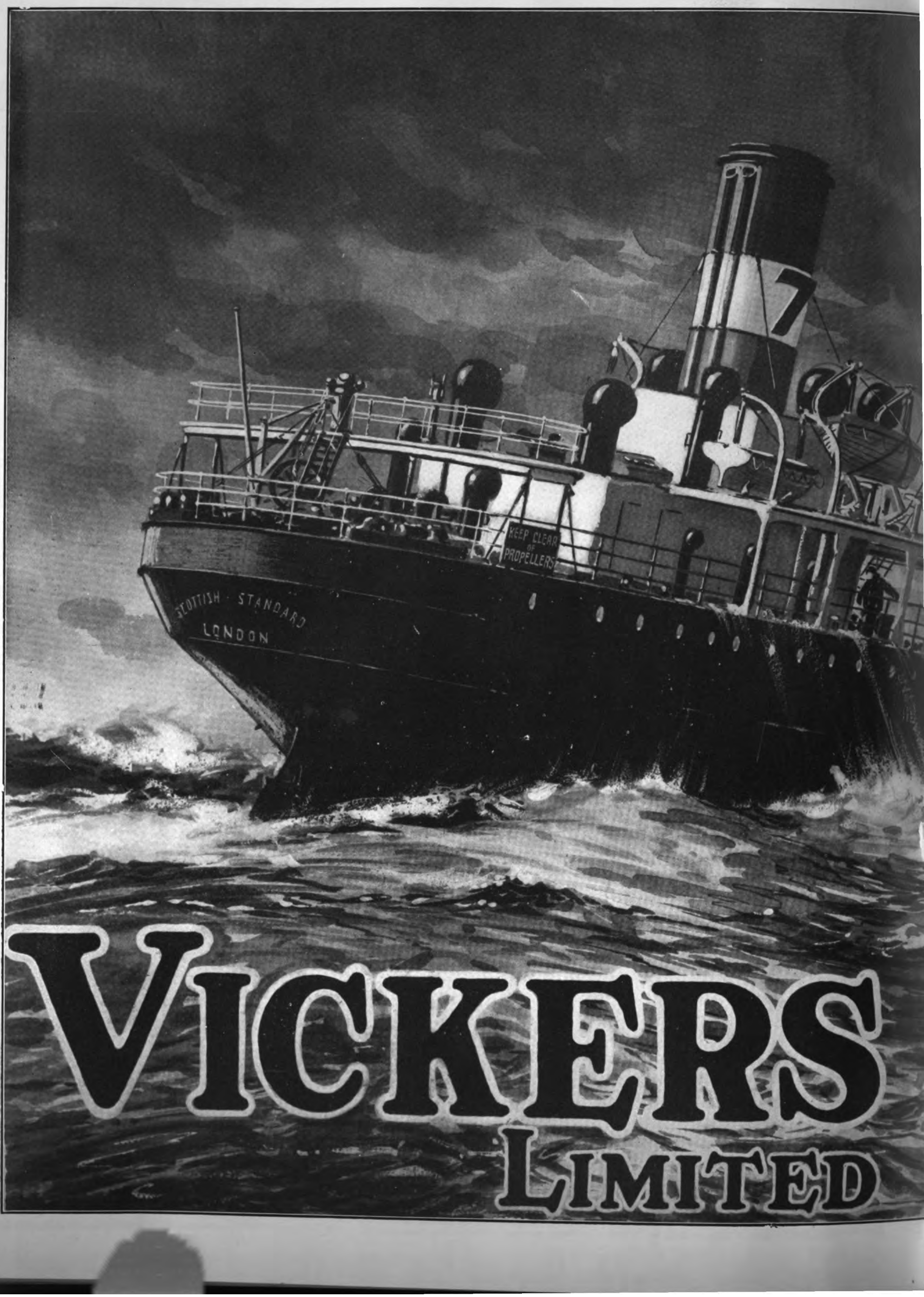

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Specially designed for Mercantile-Marine use. Rugged, Rigid, Simple and Accessible. No Injection Air Compressor. Rating conservative and quoted in Brake Horse-Power. Guaranteed for continuous running. The design embodies the experience of Marine Oil-Engines totalling half-a-million horse-power.

Works: Barrow-in-Furness, England
Head Office: Vickers House, Broadway, London, S. W. I.
New York Office: 2550 Woolworth Building, 233 Broadway

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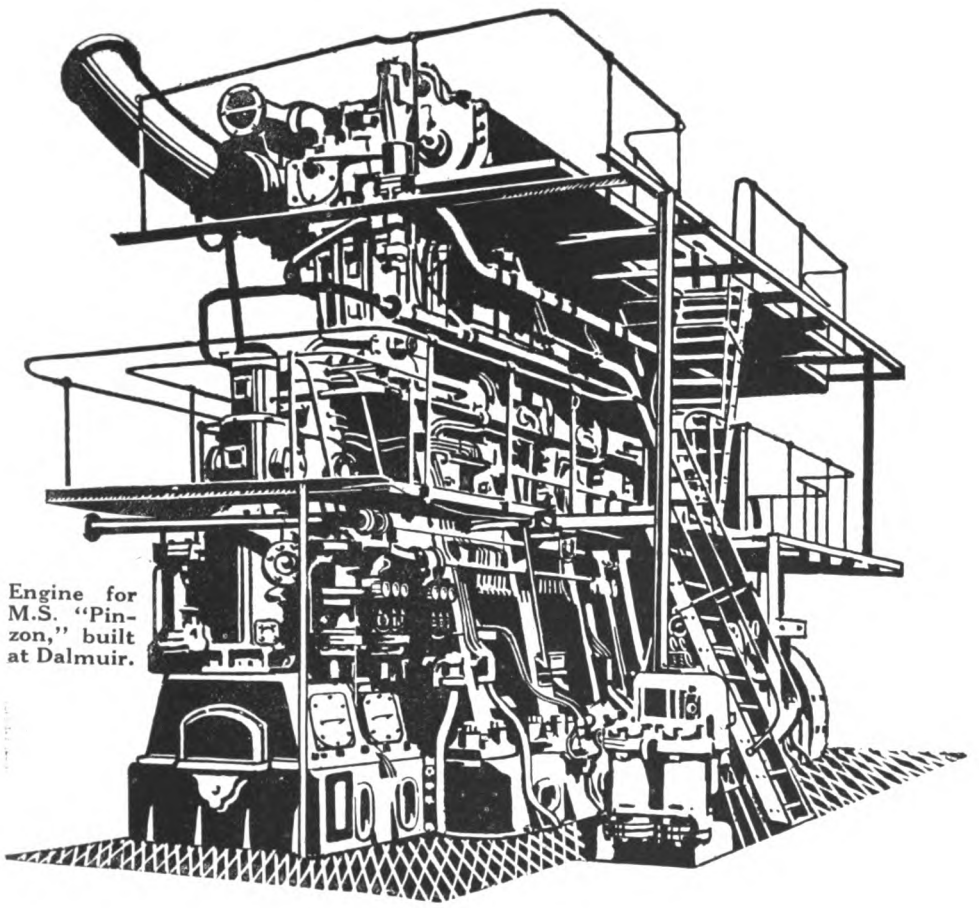
BEARDMORE-TOSI DIESEL *Marine Engine*



Engine for M.S. "Pinzon," built at Dalmuir.

THE ENGINE THAT REPRESENTS THE GREATEST ADVANCE IN DESIGN AND IN MARINE PROPULSION

Results of 100 Hours' Trial.

Average B.H.P.	**1,276**
Mechanical efficiency, per cent.	**77**
Average I.H.P.	**1,646**
Revolutions per minute	**124**
Mean pressure on B.H.P. basis, lb. per square inch	**75.5**
Fuel consumption, lb. per P.H.P. per hour	**.42**
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	**4.5**
Exhaust temperature, average at exit from exhaust valve, deg. Fah.	**550**
Lubricating oil pressure, lb. per square inch	**10-12**
Circulating water pressure (jacket), lb. per square inch	**10-15**
Piston cooling water pressure, lb. per square inch	**20-30**
Water temperature at outlet from cylinder heads, deg. Fah., average.	**125**
Piston cooling water, outlet temperature, deg. Fah., average	**130**
Blast air pressure, lb. per square inch	**1,000**

Extract from THE ENGINEER, November 11th, 1921.

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

Full particulars from the builders—

WILLIAM BEARDMORE AND COMPANY LIMITED

NAVAL CONSTRUCTION WORKS: DALMUIR, SCOTLAND.
LONDON OFFICE: 36 VICTORIA ST. S.W.1.

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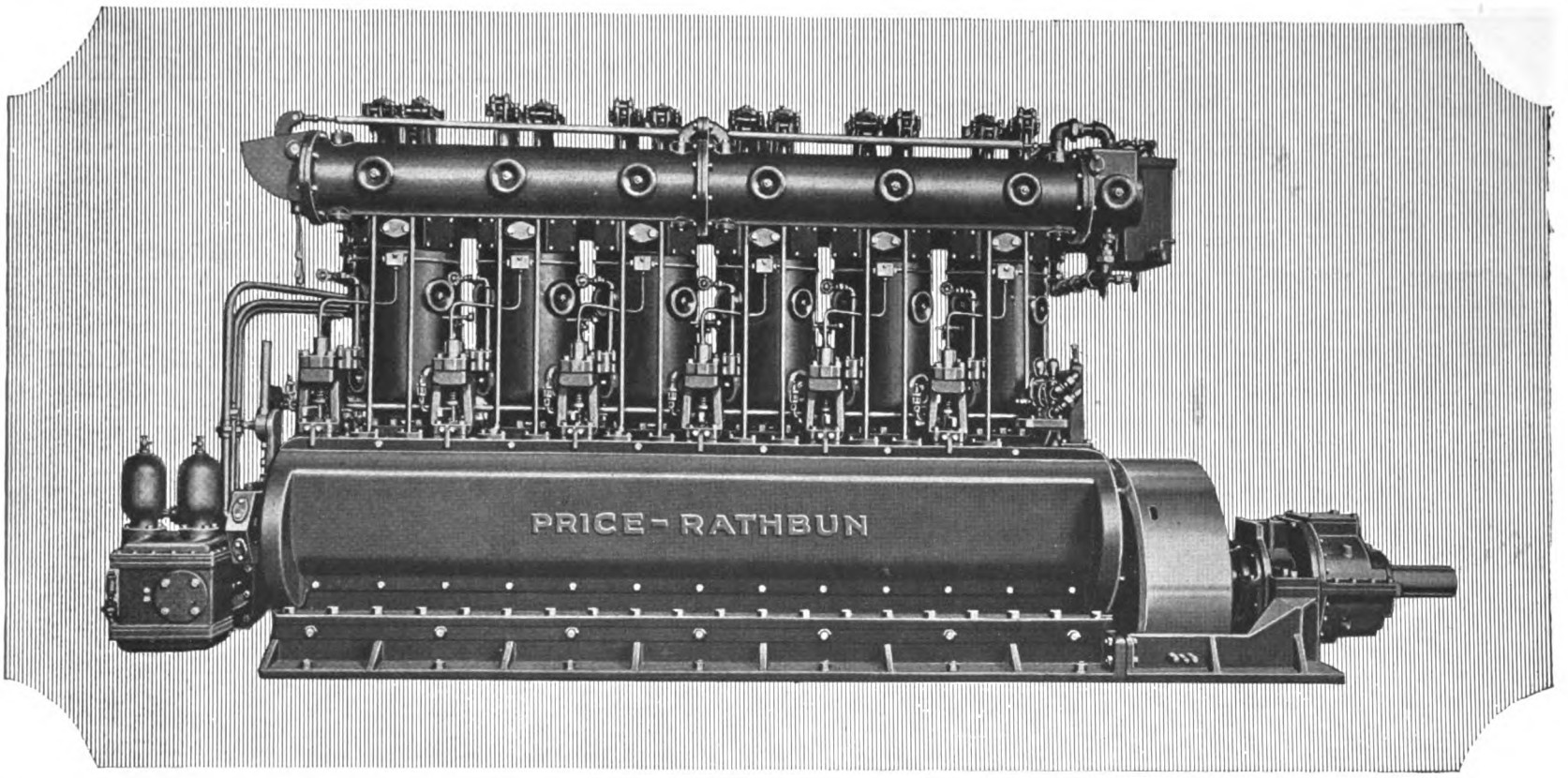

The Advantages of Oil Engine-Electric Drive

for ship propulsion can be fully realized only when the electrical equipment is combined with oil engines possessing the *simplicity* and *high fuel economy* of the

PRICE-RATHBUN ENGINE

A line of sizes ranging from 240 to 750 BHP has been developed which gives the ship operator a wide choice in number and size of engine generator sets. These engines

Are designed for marine installation.

Have six cylinders.

Use the Price system of direct injection of fuel, eliminating the high pressure injection air compressor and thereby reducing the weight and floor space of installation.

Have automatic pressure system of lubrication.

Have a simple yet sensitive governor control which automatically proportions the fuel charge to meet load fluctuations, maintaining the constant speed essential for correct operation of electric generators and motors.

Have moderate weight per horse-power making it possible for total weight of installation to be no greater than for a direct drive installation.

Our engineers will be glad to go into full details with you with reference to marine oil engine electric drive.

INGERSOLL-RAND COMPANY, 11 Broadway, New York

PRICE-RATHBUN Engines are also built for direct drive in sizes from 220 to 750 BHP.

19-MOE

Ingersoll-Rand

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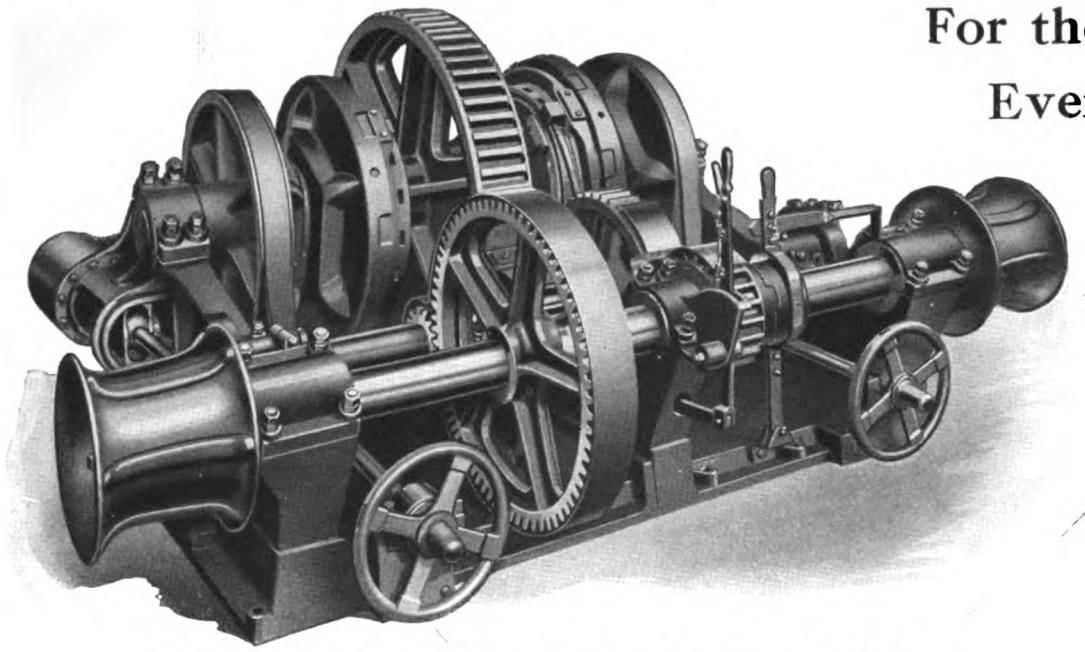

A-E-Co *Windlass installed on the oil tanker "Wm. Rockefeller"*

For the Largest Oil Tanker Ever Built in the U. S.

They Chose

A-E-CO Steering Gear

A-E-CO Windlass

A-E-CO Winches

The Standard Oil Company insists on equipment that is unfailingly reliable. Naturally they selected A-E-Co Auxiliaries for the "Wm. Rockefeller," the largest tanker ever built in the United States.

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American Engineering Company

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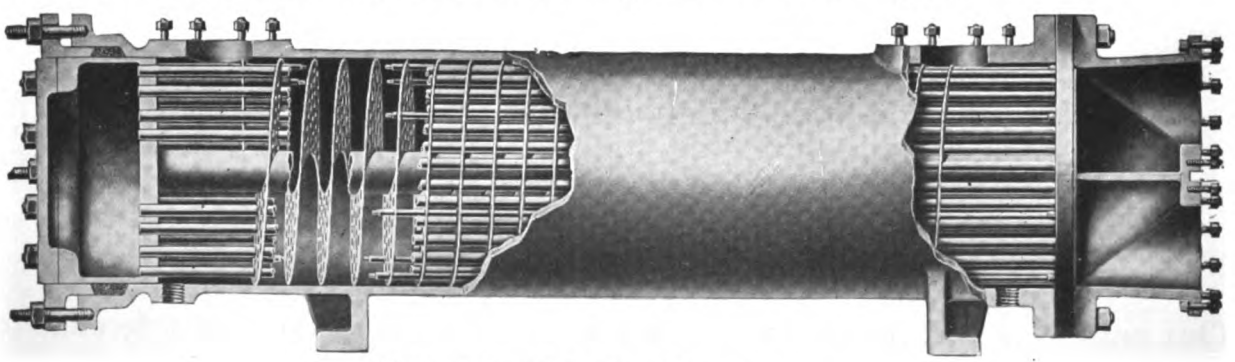
PHILADELPHIA, PA.

WE ALSO BUILD
Steering Gears, Telemotors, Windlasses, Winches, Capstans, Gypseys, Chandlery

Do Your Diesel Engine Bearings Run Cool at Heavy Loads?

Multiwhirl Coolers are extensively used for cooling Diesel lubricating oil.



Multiwhirl Cooler

The oil is directed in its flow through the shell by the helical baffle and gives up its heat to the circulating water in the copper tubes.

The shell is bored throughout to insure against foundry scale or sand contaminating the oil.

Bulletin No. 904 tells the complete story. It's yours for the asking.

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Philadelphia, Boston, Hartford, Rochester, Pittsburgh, Cleveland, Toledo, Detroit, Chicago, Syracuse, Minneapolis, St. Louis, New Orleans, Salt Lake City, Denver, Houston, Fort Worth, Charlotte, San Francisco, Seattle, Los Angeles, Kansas City, Milwaukee

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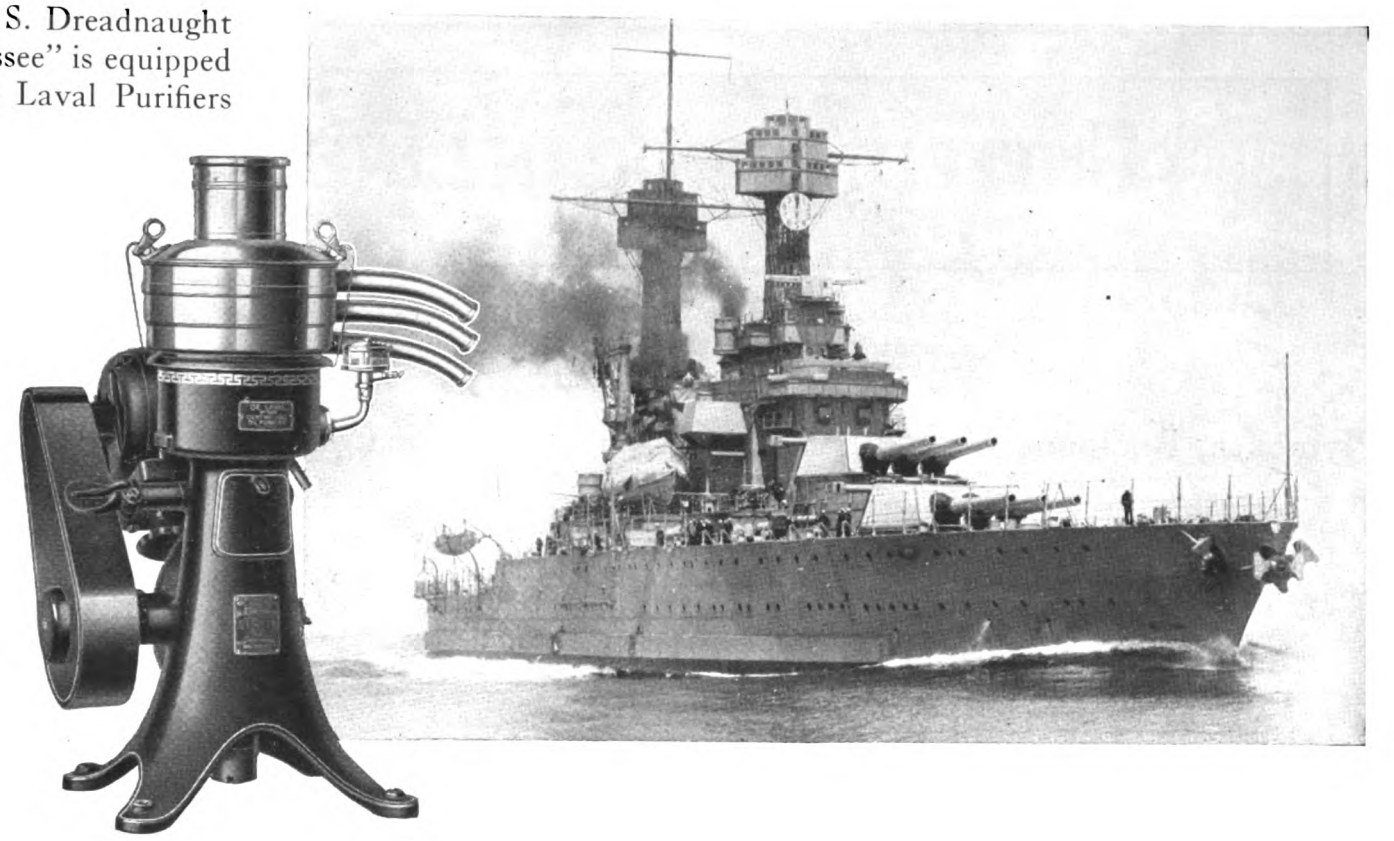
The U. S. Dreadnaught "Tennessee" is equipped with De Laval Purifiers



De Laval Oil Purifiers are protecting machinery and saving oil on the latest U.S. battleships—on all U. S. destroyers—on more than 500 merchantships—in most of America's largest power plants, and in hundreds of smaller ones.

Navy Saves with Oil Purifiers

Admiral Robison, chief of the Navy Bureau of Engineering, in testimony before the Senate appropriations committee in behalf of funds for his service during the coming year, referred to water getting into oil in oil-burning ships, leaving the ships without power. To overcome this difficulty, electric feed pumps and fuel-oil service pumps running from a storage battery are required. He recommended fuel-oil refiners for the ships, stating that the Navy has placed oil purifiers on every battleship and destroyer to purify lubricating oil, and that these devices are saving an average of their full cost every year. —Power, July 11, 1922

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway Chicago, 29 East Madison St.

De Laval Pacific Company, San Francisco, Cal.
Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a De Laval

Please send Bulletin containing further information regarding the De Laval Oil Purifier as checked below:

☐ Purification of turbine lubricating oil.

☐ Purification of Diesel lubricating oil.

☐ Dehydration of transformer oil.

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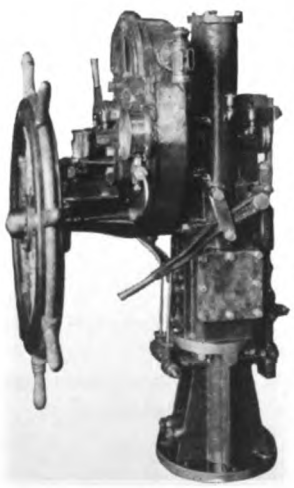
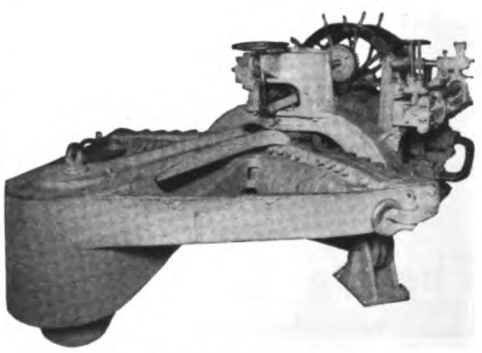
CUNNINGHAM
ELECTRIC AUXILIARY MACHINERY

The Pioneer American Line of Electric Deck Machinery



The "CUNNINGHAM" geared spring quadrant type electric-hydraulic steering gear (KENNICOTT TYPE) controlled by our MACTAGGART-SCOTT safety steering TELEMOTOR, is the IDEAL STEERING GEAR for MOTORSHIPS.

The floating quadrant driving the tiller through compression springs, provides a thoroughly resilient connection with the rudder. The hydraulic variative power and speed transmission gear gives maximum speed and control of the rudder at ordinary helm angles and maximum torque at hardover positions without overloading the electric motor, which runs continuously.



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Steering Gears—Windlasses—Winches—Capstans—For Motorships

ALLAN CUNNINGHAM CO., Inc.

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Maritime Engineering & Sales Corp.
2 Rector St., New York City, N. Y.
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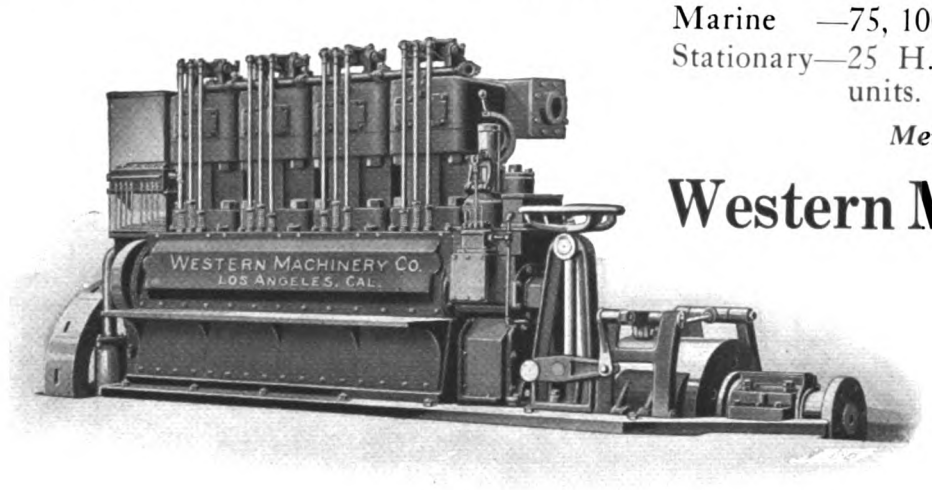
Power Equipment *That Pays Its Way*—

"WESTERN" Diesel Marine ENGINES

Full Diesel—Solid Injection

In savings effected through lower fuel and operating costs, the "Western" will pay you back its full original cost in a very few months, and after that a handsome profit month after month.

"Western" Diesel Engines operate on the lowest grades of fuel oils in their natural state, and the fuel consumption is exceptionally low. We can show you savings that will make the change from less efficient power equipment highly desirable. Put the burden of proof up to us.



Marine —75, 100, 150 H.P., 3, 4 and 6 cylinders.
Stationary—25 H.P. per cylinder, one to six cylinder units.

Mention Catalog No. 507

Western Machinery Company

General Offices and Factories:
907 No. Main Street
LOS ANGELES, CALIFORNIA

San Francisco Seattle

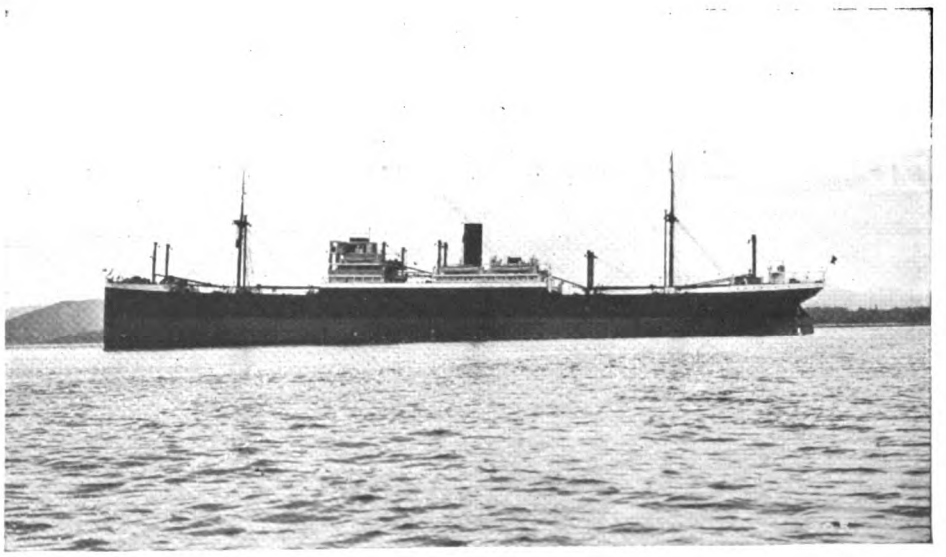
"Western" Diesel Marine Engine, 4 cylinder, 100 horsepower unit.

HARLAND & WOLFF L^TD

Shipbuilding and Engineering Works

BELFAST ◦ GLASGOW ◦ GREENOCK

M. S. "Glenogle"
Deadweight Capacity
12,300 Tons



Built for the Glen Line

Diesel Engine Works, FINNIESTON & SCOTSTOUN, GLASGOW

Repair Works, LIVERPOOL AND SOUTHAMPTON

London Office, 1a Cockspur St., S. W.

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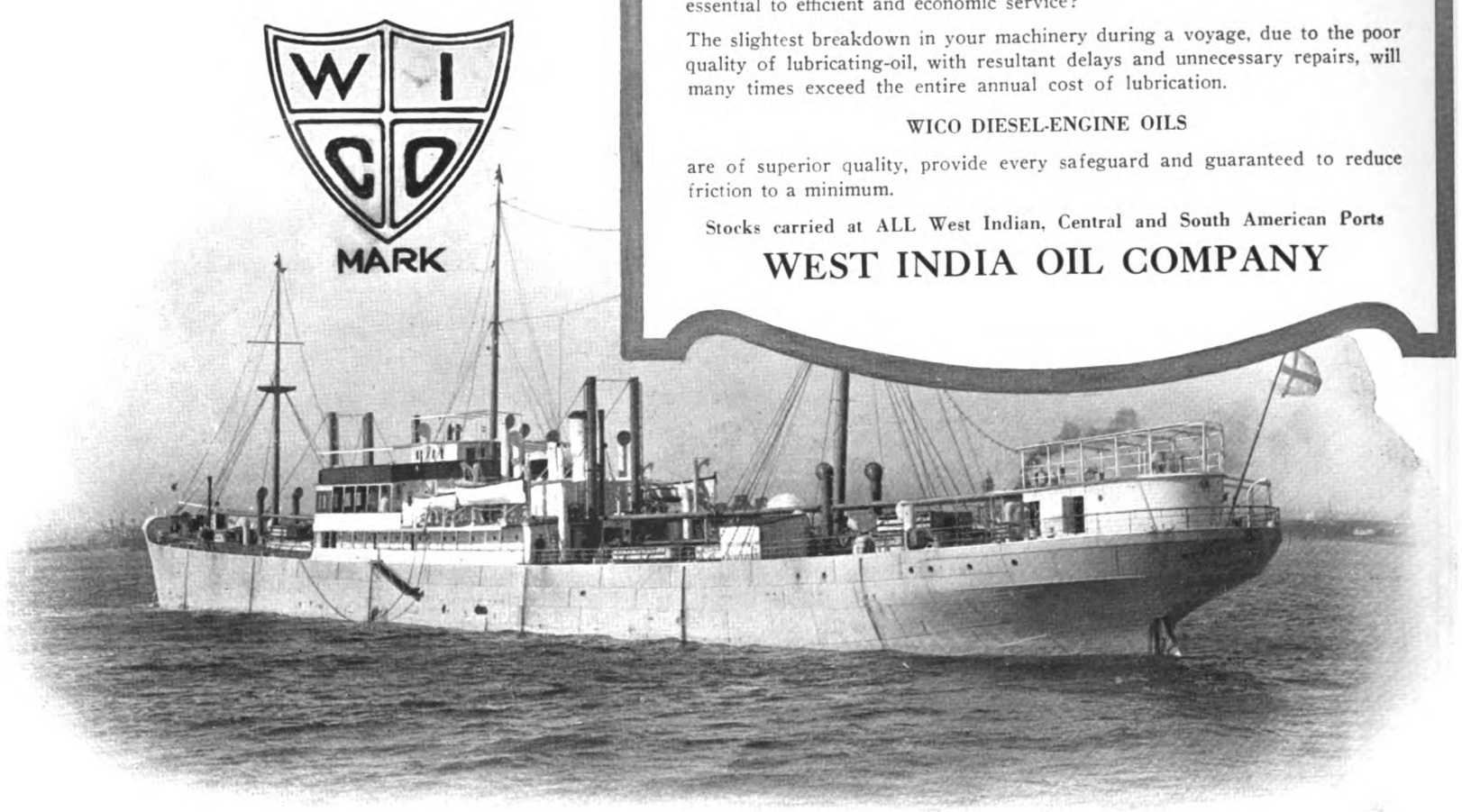


MR. ENGINEER!

Have you ever realized that the proper operation of the engines of your vessel depends chiefly on the quality of lubricating-oil used and its ability to provide and maintain that protecting film between the metallic surfaces so essential to efficient and economic service?

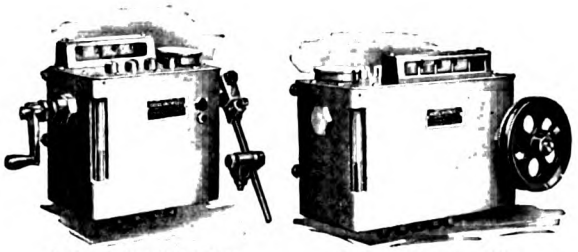
The slightest breakdown in your machinery during a voyage, due to the poor quality of lubricating-oil, with resultant delays and unnecessary repairs, will many times exceed the entire annual cost of lubrication.

WICO DIESEL-ENGINE OILS

are of superior quality, provide every safeguard and guaranteed to reduce friction to a minimum.

Stocks carried at ALL West Indian, Central and South American Ports

WEST INDIA OIL COMPANY



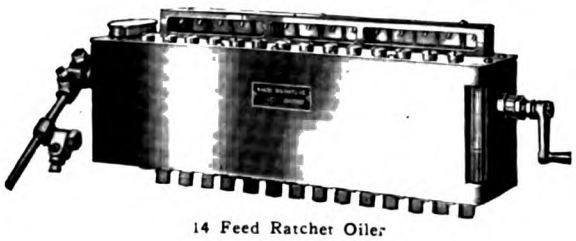
4 Feed Ratchet Oiler 5 Feed Rotary Oiler

"Manzel" Oilers are made in sizes and styles to fit any engine.

They can be furnished with any number of feeds; with rotary, ratchet, or direct lever drive; large or small reservoirs; polished brass or painted finish.

There is a Manzel Oiler to meet your requirements no matter how large or small your engine may be.

Write for Catalogue



14 Feed Ratchet Oiler

"Manzel" Force Feed Oilers

Manzel Oilers are designed to lubricate the cylinders and bearings of Diesel and other heavy-duty engines in the most positive and economical way.

They are the result of more than twenty years experience in the manufacture of Force Feed Oilers.

Simple in design, but strong and durable, they supply the oil in just the right quantity where and when it is needed.

Each feed is regulated independently, and may be adjusted to supply the exact amount of oil required, no matter how much or little is needed.

The feed is always in sight, enabling the operator to see at all times exactly how much oil is being supplied to each cylinder or bearing.

Manzel Oilers are built in the largest plant in the world that is devoted entirely to the manufacture of Force Feed Oiling Devices. They are made by experts who have made a specialty of Force Feed Oilers since 1898, and who understand the requirements necessary for effective lubrication of heavy duty engines.

Manzel Force Feed Oilers are used as standard equipment by builders of the better engines everywhere.

Let us quote on your requirements

Manzel Brothers Company

300-302 Babcock St., Buffalo, N. Y., U.S.A.

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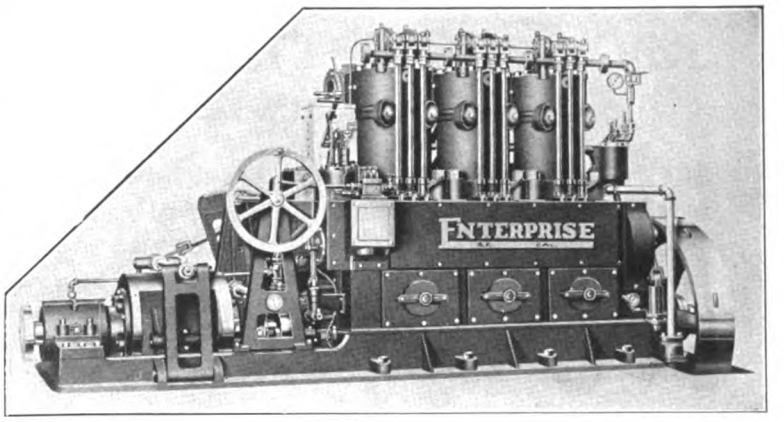
Repair and Maintenance Costs Reduced to an Absolute Minimum

There are many special features that are exclusive with the Enterprise Engines that are in large measure responsible for the low cost and operating expenses and the service given.

These features are known to Enterprise Diesels only; without these exclusive features Enterprise engines would be no different from ordinary Diesels.

We shall be glad to explain to you personally the value of the many exclusive features that the Enterprise Diesels possess, if you are interested.



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H. G. McLAUGHLIN CO.
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ENTERPRISE ENGINE COMPANY

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Cap'n Allswell says:

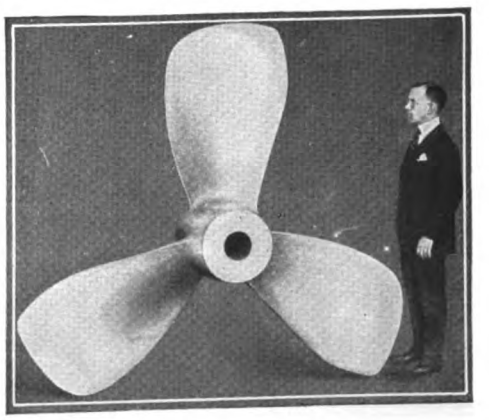
"They cut the water as slick as a whale's flukes

minimizing friction and converting the maximum power into push.

"That's because they're made of manganese bronze that permits a finer accuracy of design than metals of lower breaking strength."

"Columbian Bronze Propellers conserve power, increase efficiency and practically eliminate the expense and danger of broken blades."

Write for the Columbian Book



COLUMBIAN *Bronze* PROPELLERS

N. Y. C. Sales Only: 44 Third Ave. THE COLUMBIAN BRONZE CORP., 218 N. Main St., Freeport, N. Y.

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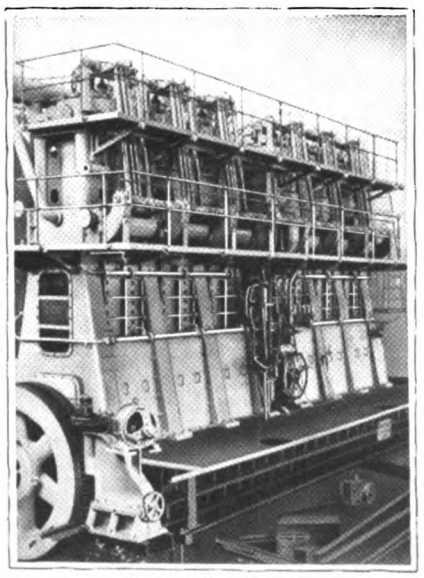

OILENGINE 1550 IHP
LICENSEES OF BURMEISTER AND WAIN OILENGINES FOR GERMANY AND ITALY.

8000 Employees

High Class Freighters and Tankers with Piston Engines and Steam Turbines

19 Berths for Ships up to length of 820 feet

Floating Docks of 4000 and 8000 tons Capacity

SPECIALTY: MOTORSHIPS WITH BURMEISTER AND WAIN OIL-ENGINES

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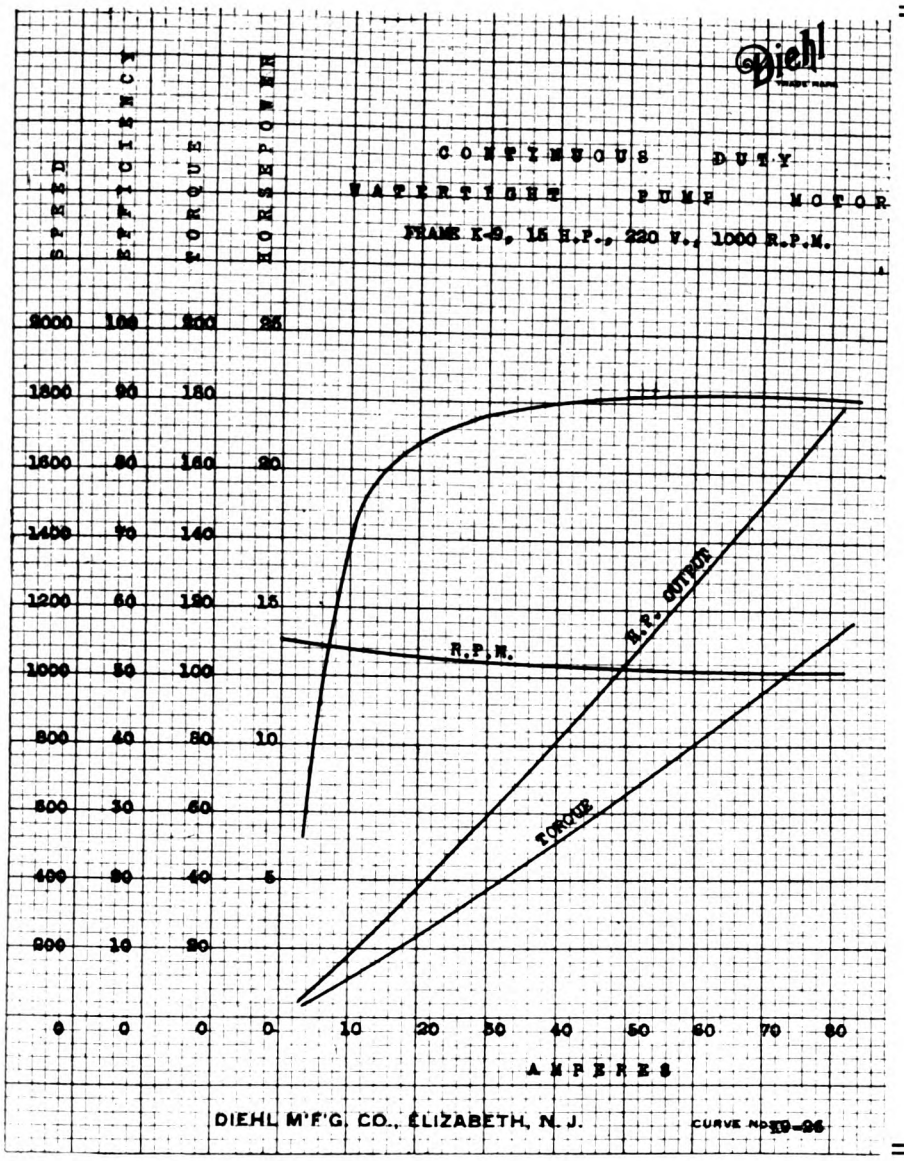


Record of Test 15 H.P. Output for 8 Hours

Temperature Rise °C Thermometer	
Armature Winding	37
Field Winding	30
Interpole Winding	35
Commutator	33
Ball Bearings	22

These motors are now in service on Motorships "Californian" and "Missourian" — American-Hawaiian SS. Co.

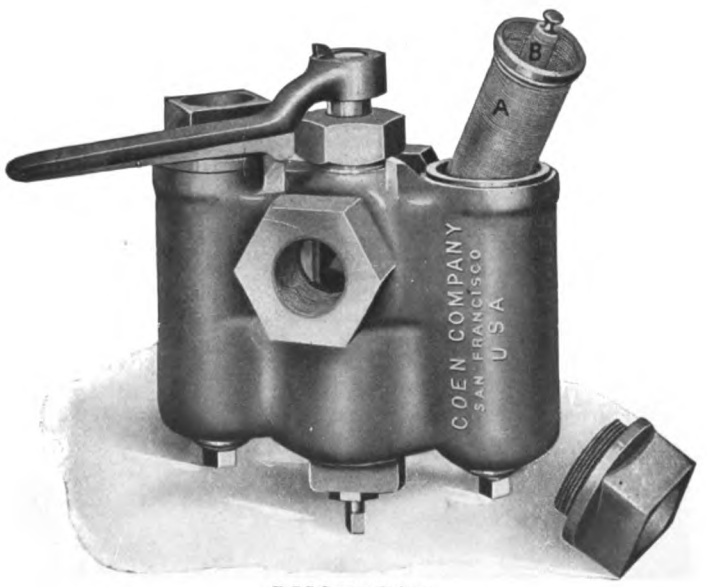
Conservative Marine Engineers who contemplate the installation of electric motors on ships and who expect the same reliable service which they are accustomed to obtain from steam driven auxiliaries, will be interested in this motor performance.

DIEHL MFG. CO., Elizabeth, N. J.

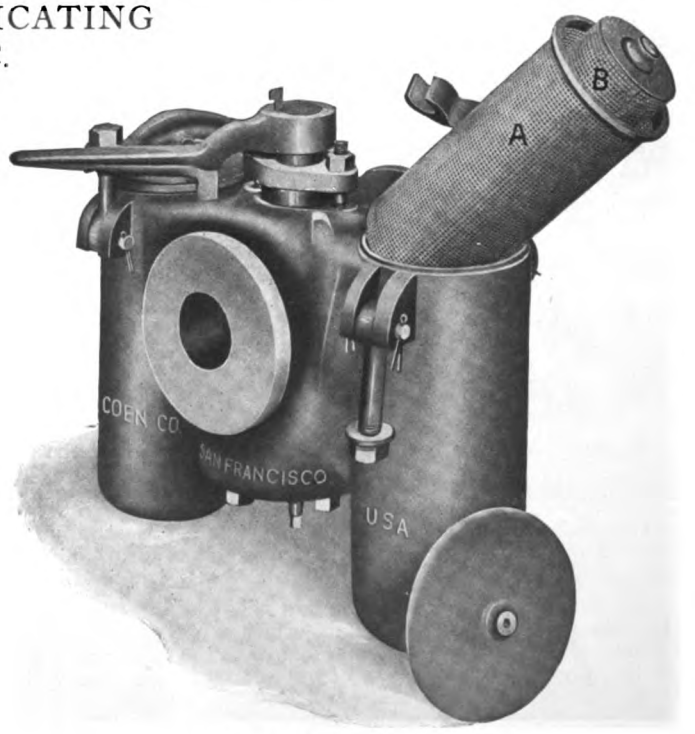
"COEN" DUPLEX STRAINER

FOR

FUEL AND LUBRICATING OILS, ETC.



DISCHARGE



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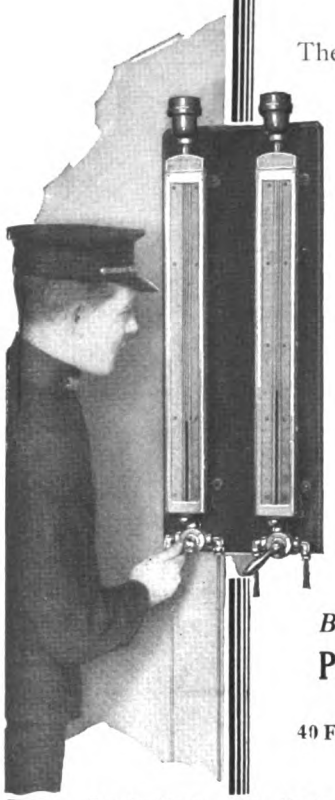
PNEUMERCATOR TANK GAUGES

A Necessity on Any Oil Burner From Liner to Tugboat



The only *direct-reading* gauge which will give you *accurate information*, and in units of *tank depth and weight* or *volume*. For oil cargo, fuel oil settling, ballast or water tanks, or bilges—also a special type for registering ship's fore, aft and mean draft.

The instruments give you a perpetual inventory without going near the tanks. They check invoices, fillings and withdrawals and, on oil burners, the hourly or daily fuel consumption. They guard against overfilling and flooding the decks.

Allowed by American Bureau of Shipping, Lloyds, and British Board of Trade.

Bulletin No. 202 Describes Them

Pneumercator Company, Inc.

Sperry Bldg.,
40 Flatbush Ave. Extension, Brooklyn, N. Y.

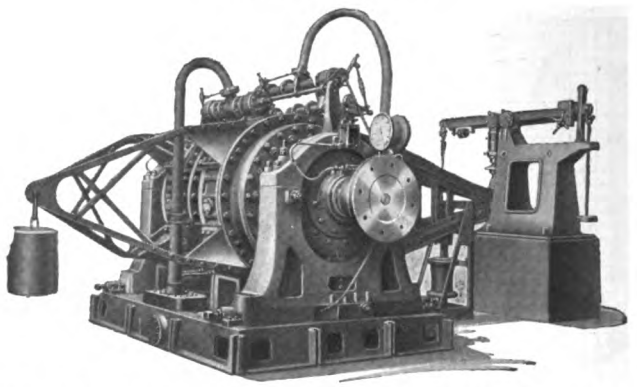
P-151

Trade Mark Reg. U.S. Pat. Off.
Pneumercator Gauges
Standard for Ships' Oil, Fuel and Ballast Tanks

FROUDE DYNAMOMETERS

FOR

TESTING DIESELS



One of four Froude Dynamometers in the McIntosh & Seymour Corporation Plant at Auburn, N. Y.

This Dynamometer is Reversible and has a capacity of 3000 B.H.P.

WE FURNISH DYNAMOMETERS FOR ANY SIZE AND ALL TYPES OF PRIME MOVERS

For specifications, prices or illustrated descriptive bulletin write

C. H. WHEELER MFG. CO.

PHILADELPHIA, PA.

BRUNSWICK

REFRIGERATING AND ICE MAKING MACHINERY

"The standard for all marine installations"

Announcement

We are pleased to announce the incorporation of the

BRUNSWICK - KROESCHELL COMPANY

a consolidation of Brunswick Refrigerating Company of New Brunswick, New Jersey; Kroeschell Bros. Co. and Kroeschell Bros. Ice Machine Company of Chicago, Illinois.

The New Company will maintain the present offices and factories in New Brunswick and Chicago with the various branch offices, and will combine the facilities and personnel of the former companies so that its customers may be assured of the most efficient service.

Brunswick Refrigerating Company
Kroeschell Bros. Co.
Kroeschell Bros. Ice Machine Company

Brunswick-Kroeschell Company

Brunswick NH_3 Ice Machines — New Brunswick, N. J.

Kroeschell CO_2 Ice Machines — Chicago, Ill.

Technical Books On Oil Engines

For the Convenience of our Readers a supply of Books on Diesel and other Types of Oil-Engines are Carried in Stock at the Office of **MOTORSHIP** for Disposal at Publishers' Prices.

Send for Our Descriptive Printed List

Books Cannot Be Sent on Approval

In Cases Where Books have Been Imported, Customs Duty, Shipping and Handling Charges Have Been Added to the Foreign Publishers' Prices.

MOTORSHIP

282 West 25th Street
New York City

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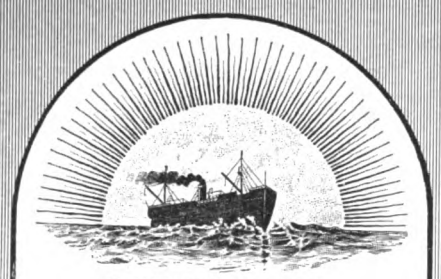
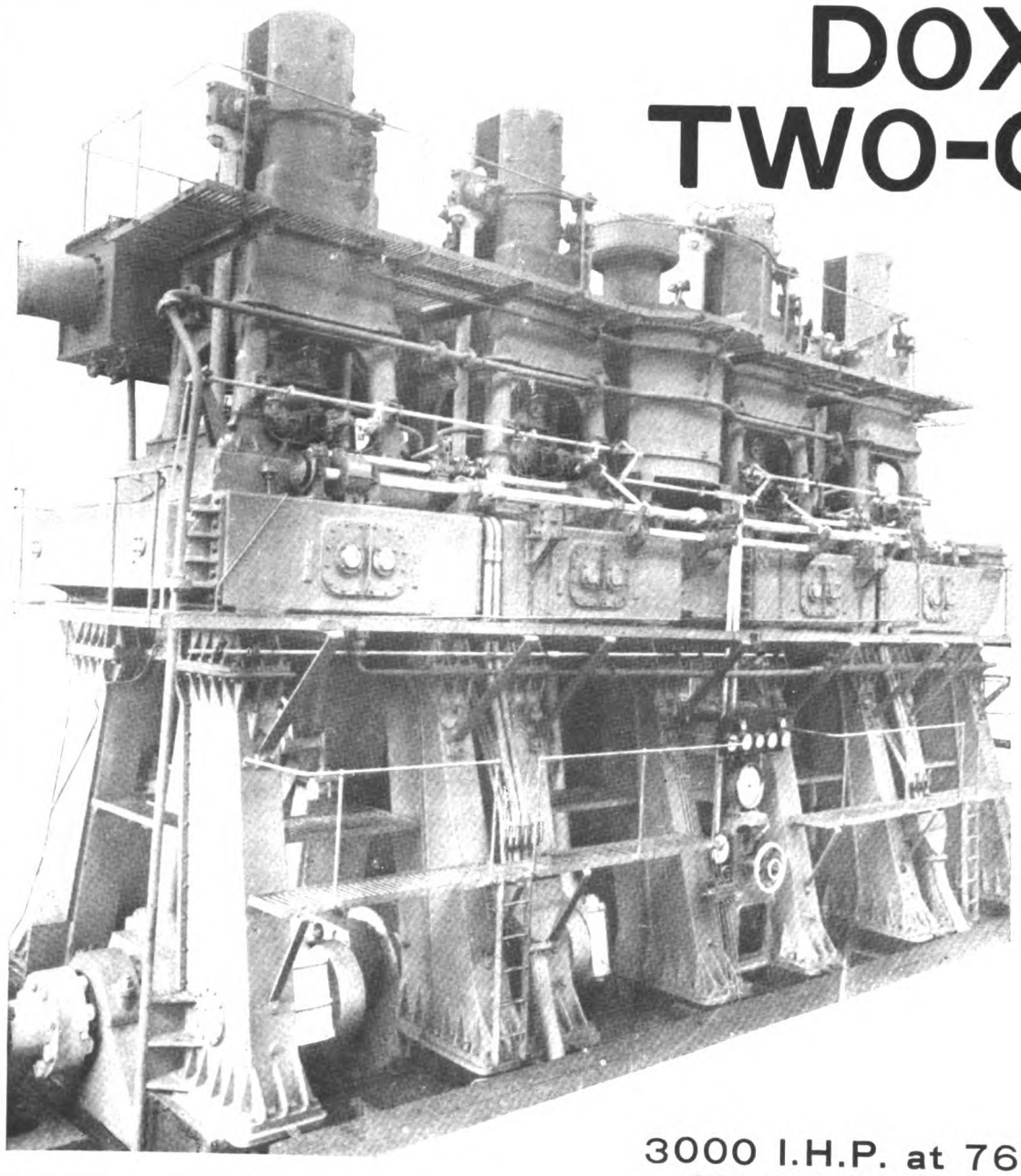


SUN SHIPB
DIESEL

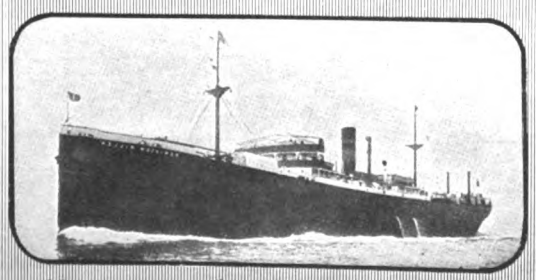
BUILDERS AND

DOXFORD
TWO-CYCLE



3000 I.H.P. at 76 R.P.M.
ON SINGLE SCREW

DOXFORD AND



MOTORSHIP "DOMINION MILLER"

PHILADELPHIA OFFICE
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MAIN OFFICE
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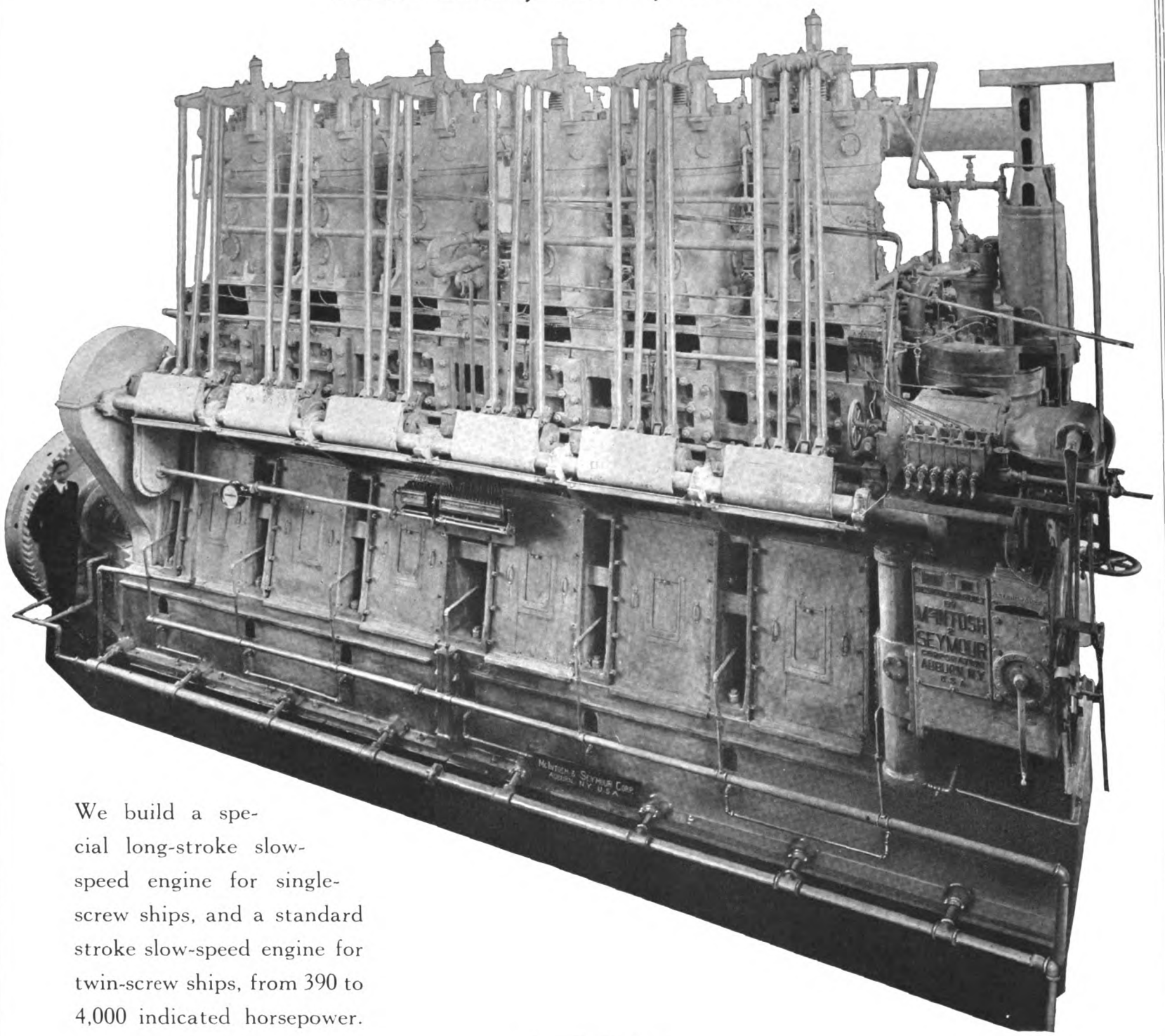
McINTOSH & SEYMOUR CORPORATION

AUBURN, N. Y., U. S. A.



We build a special long-stroke slow-speed engine for single-screw ships, and a standard stroke slow-speed engine for twin-screw ships, from 390 to 4,000 indicated horsepower.

Let us send you our bulletin No. 66, "Achievements in Motor Ships."

(1,200 I.H.P.)
PORT ENGINE
"MS. KENNECOTT"
illustrated on the front cover of this magazine.

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149 BROADWAY
New York City

815 SHELDON BLDG.
San Francisco, Calif.

412 BISBEE BLDG.
Jacksonville, Fla.

700 INTERSTATE BLDG.
Kansas City, Mo.

325 HAMBLE BLDG.
Houston, Texas

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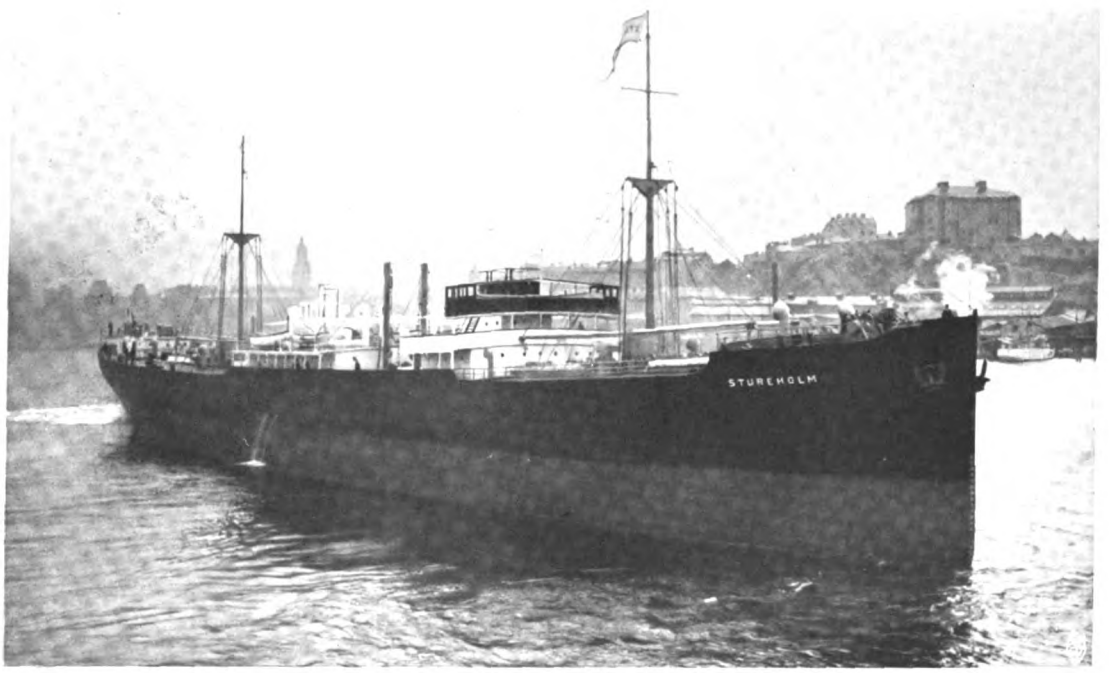
PERFORMANCES OF GÖTAVERKEN MOTORSHIPS



No. 3 M.S. "STUREHOLM"

7,800 tons d. w. Owners: The Swedish-American-Mexico-Line

Date of delivery	Sept. 18th 1919
Distance travelled	92,000 naut. miles
Power	2,780 I. H. P.
Average speed	10,68 knots
Daily fuel consumption	9,70 tons
Cruising radius	28,000 naut. miles

BUILT AND DIESEL-ENGINED BY THE GÖTAVERKEN

GÖTAVERKEN

GÖTEBORG - SWEDEN

SHIPBUILDERS AND DIESEL-ENGINE CONSTRUCTORS

LARGEST FLOATING DRY-DOCK IN SCANDINAVIA
LIFTING CAPACITY 13,000 TONS

GÖTEBORG SWEDEN GÖTAVERKEN

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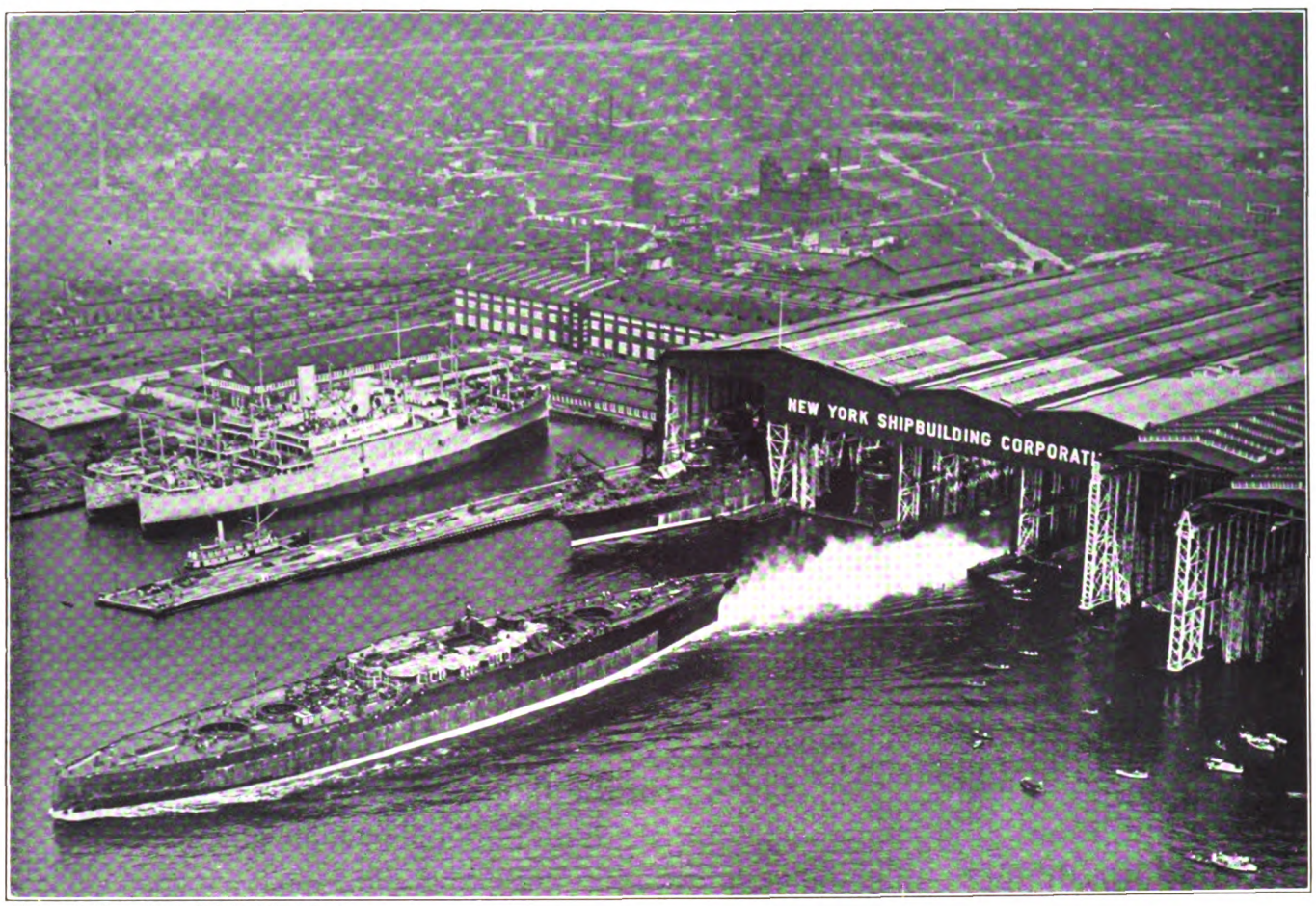


Photo. © New York Shipbuilding Corp.

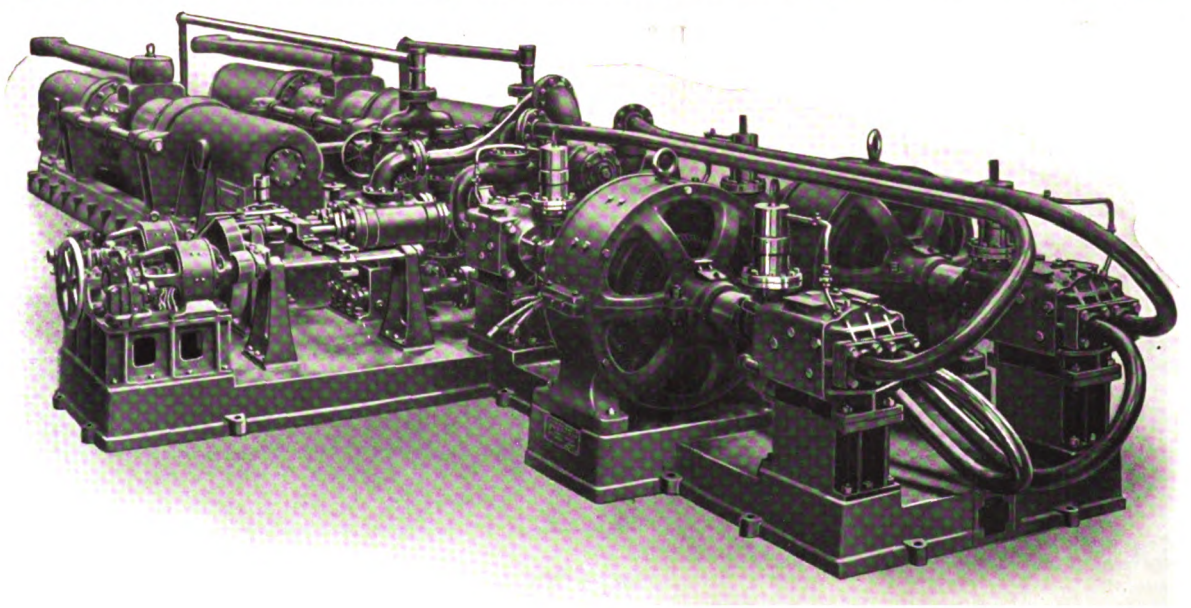
NEW YORK SHIPBUILDING CORPORATION

MAIN OFFICE AND WORKS

CAMDEN, NEW JERSEY, U. S. A.

HYDE WINDLASS COMPANY - Bath, Maine

High grade marine auxiliary machinery and manganese bronze propellers



"Hydro-Electric Steering gear installed on U. S. Battleship COLORADO"

Hydro-electric Steering-gears, electric-windlasses, electric-winches, electric-capstans for motorships a specialty

When ordering specify "HYDE"

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THE NEW IMPROVED FRISCO STANDARD HEAVY OIL ENGINE

THE OLD RELIABILITY —— THE NEW ECONOMY

THE name "FRISCO STANDARD" has always stood for unassailable leadership and dominating quality among heavy duty marine motors.

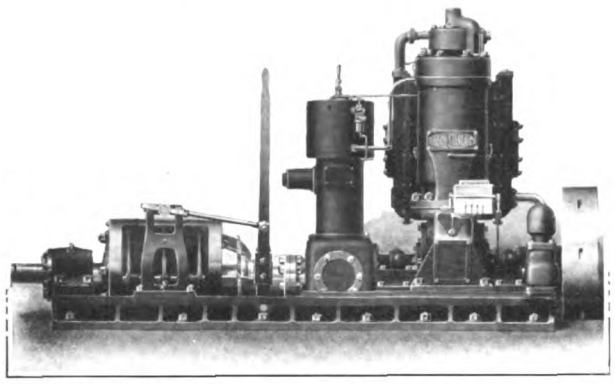
No other gasoline or distillate motor is so widely used throughout the world, nor has any acquired such a reputation for continuous dependability and endurance throughout almost never-ending years of service.

Our new product, the Frisco Standard Heavy Oil Engine, is designed and built to worthily uphold and carry on the traditional reputation of the old.

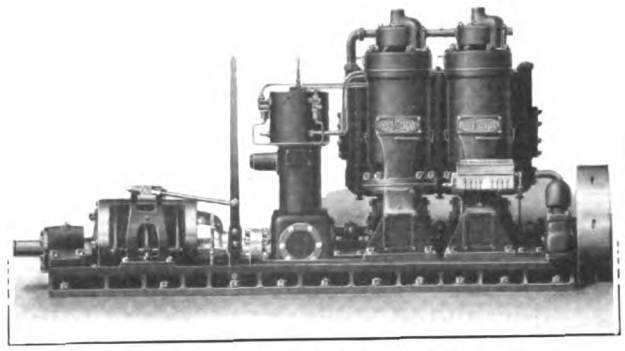
7½ to 300 B. H. P.

THE Frisco Standard Heavy Oil Engine is not an experiment. Built under license from America's most successful Surface-Ignition engine manufacturer whose product, extending over a period of fifteen years, has been a complete success, the new motor has been improved and perfected by our engineers who have added the benefits of their twenty or more years of specialized experience in the marine motor field. The result is a finer, sturdier emgine that is a step ahead of the very best in modern oil engine practice.

NO AIR INJECTION

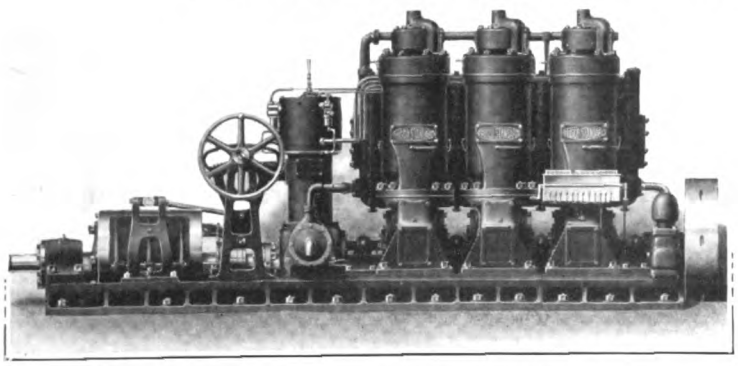


Single Cylinder Type, Built in Sizes 7½, 12½, 17½, 37½ and 50 h. p.

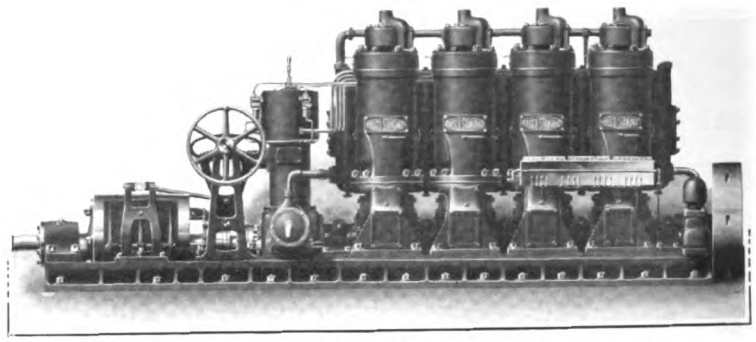


Double Cylinder Type, Built in Sizes 15, 25, 35, 50, 75 and 100 h. p.

NO WATER INJECTION



Three-Cylinder Type, Built in Sizes 25, 40, 55, 75, 110 and 150 h. p.



Four-Cylinder Type, Built in Sizes 35, 55, 75, 100, 150 and 200 h. p.

Unexcelled in Workmanship and Design

TYPE: Semi-Diesel, 2-cycle, very few working parts, simple in construction, easy of operation by the unskilled, low in first cost and low in maintenance.

COMPRESSION: Low compression allows engine to operate under the least possible strain.

FUEL: Will burn any available Diesel Fuel Oil that is free flowing.

FUEL INJECTION: Of the solid or airless injection type, eliminating high pressures. Fuel introduced into combustion chamber thoroughly broken up and vaporized spreads into every part of combustion space. This results in instant and universal ignition with complete combustion. Fuel nozzle has no small holes to carbonize and require frequent drilling out, and will operate indefinitely.

BUILT TO LLOYDS: Conforms in every way to Lloyds, Bureau Veritas and the American Bureau of Shipping's requirements for marine engines.

GOVERNOR: Absolutely a perfect governing device. In a class by itself. Not only permits of a wide range of controlled speed, but changes direction of rotation, at will of operator.

Send for Heavy Oil Engine catalog just off the press and name of nearest Frisco Standard Dealer

Many New and Exclusive Features

STARTS QUICKLY: Fitted with electric quick starting device.

AIR STARTING VALVES: Mechanically operated and properly timed to prevent any possibility of dangerous pressures being built up through neglect or inexperience of operator.

ROTARY AIR VALVES: Mechanically operated and timed to assure the correct supply of air and positive scavenging, so essential to successful operation. A decided improvement over the automatic flap valve, customarily used.

ROLLER BEARING PISTON PIN: Eliminates all trouble at this point. Our type of roller bearing in three years constant usage has not shown a diametral wear of .002 inch.

CRANK CASE AIR SEAL RINGS: Assure at all times proper crank case compression, by maintaining crank case absolutely air tight. Also prevents any leakage of oil from the bearings.

REVERSE GEARS: All engines up to and including 150 H.P., regardless of number of cylinders, fitted with reverse gears.

DIRECT REVERSING: 3, 4 and 6-cylinder engines are Directly Reversible, and handle with the ease and reliability of a steam engine.

The new improved Frisco Standard heavy oil engine is built in sizes from 7½ to 300 h.p., one to six cylinders, for both marine and stationary purposes. In every respect, the features that have characterized the Frisco Standard distillate engine for years and made it the world's leader among work boat engines, have been carried out in the design and construction of the heavy oil engine.

Frisco Standard dimensions are everywhere much larger than is ordinarily considered necessary in oil engine practice; horse power ratings are exceedingly conservative; accessibility of parts has been made one of the prime considerations and the unit system of construction, combined with the machining of all parts to jigs and gauges, assures absolute interchangeability and minimizes cost of material with little time lost in effecting replacements.

Dennison & King Streets **STANDARD GAS ENGINE CO.** Oakland, Cal., U. S. A.

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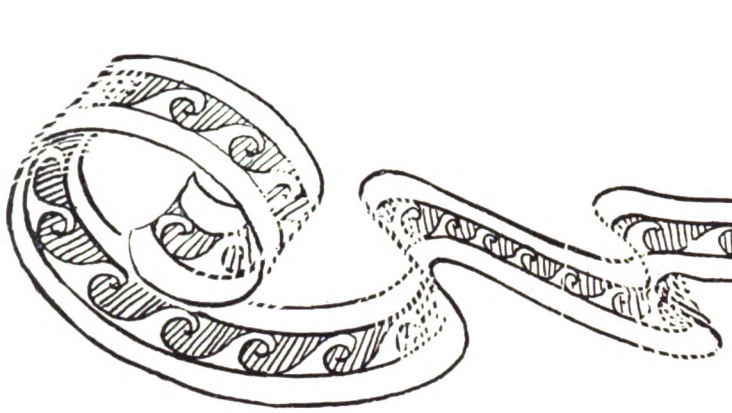


Win

OIL DIESEL TYPE E

DOLPHIN

Length 180'; Beam 24'; Speed 15 Knots

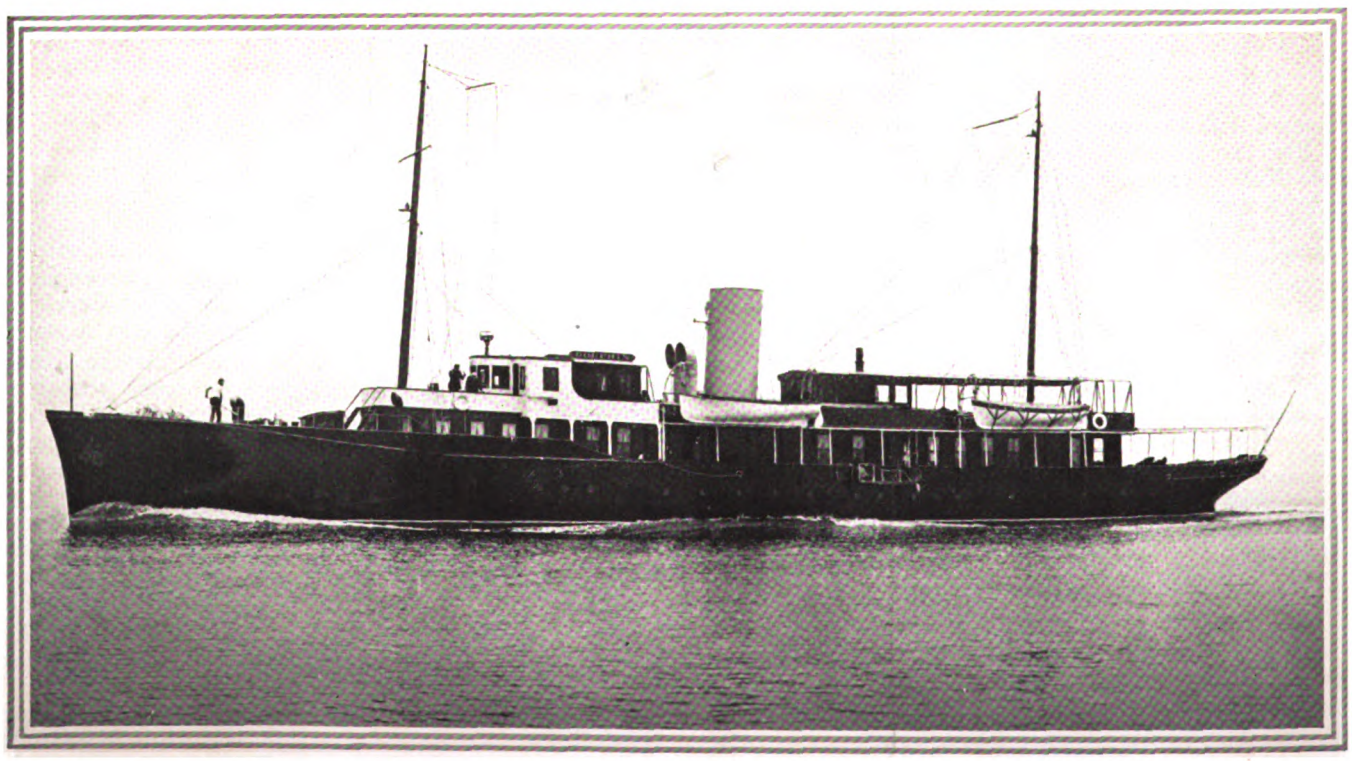
Cruising Radius: 6000 miles

Owner: Mr. Mortimer L. Schiff, New York

Designers: Cox & Stevens, New York City

Builders: Newport News Shipbuilding & Drydock Company

Power Plant: A pair of eight cylinder Winton Diesel Oil Engines rated at 550 H. P. each, designed and built by the Winton Engine Works, Cleveland, O.



WINTON ENGINE WORKS,

New York City—A. G. Griese, Inc., 30 Church St. *Seattle*—H. W. Starrett, Sunset Engine Co.
Washington, D. C.—R. L. Fryer, 817 Alboe Bldg.

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CLEVELAND, OHIO, U. S. A.

Los Angeles, Cal.—F. G. Bryant, 704 Delta Bldg.
New Orleans, La.—A. Baldwin & Company

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WERKSPOOR D

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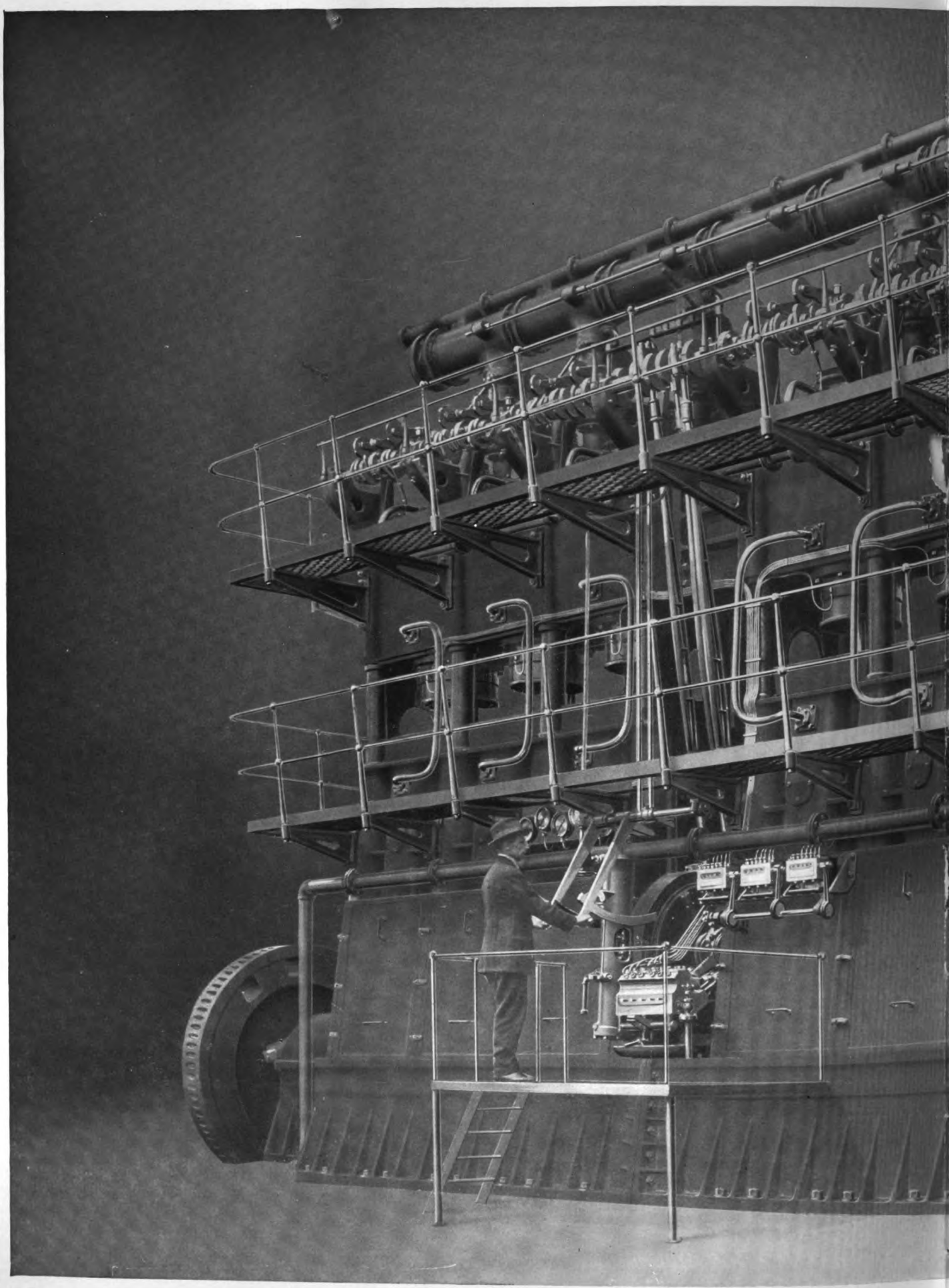

ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INSTAL

PACIFIC DIESEL E

OAKLAND,

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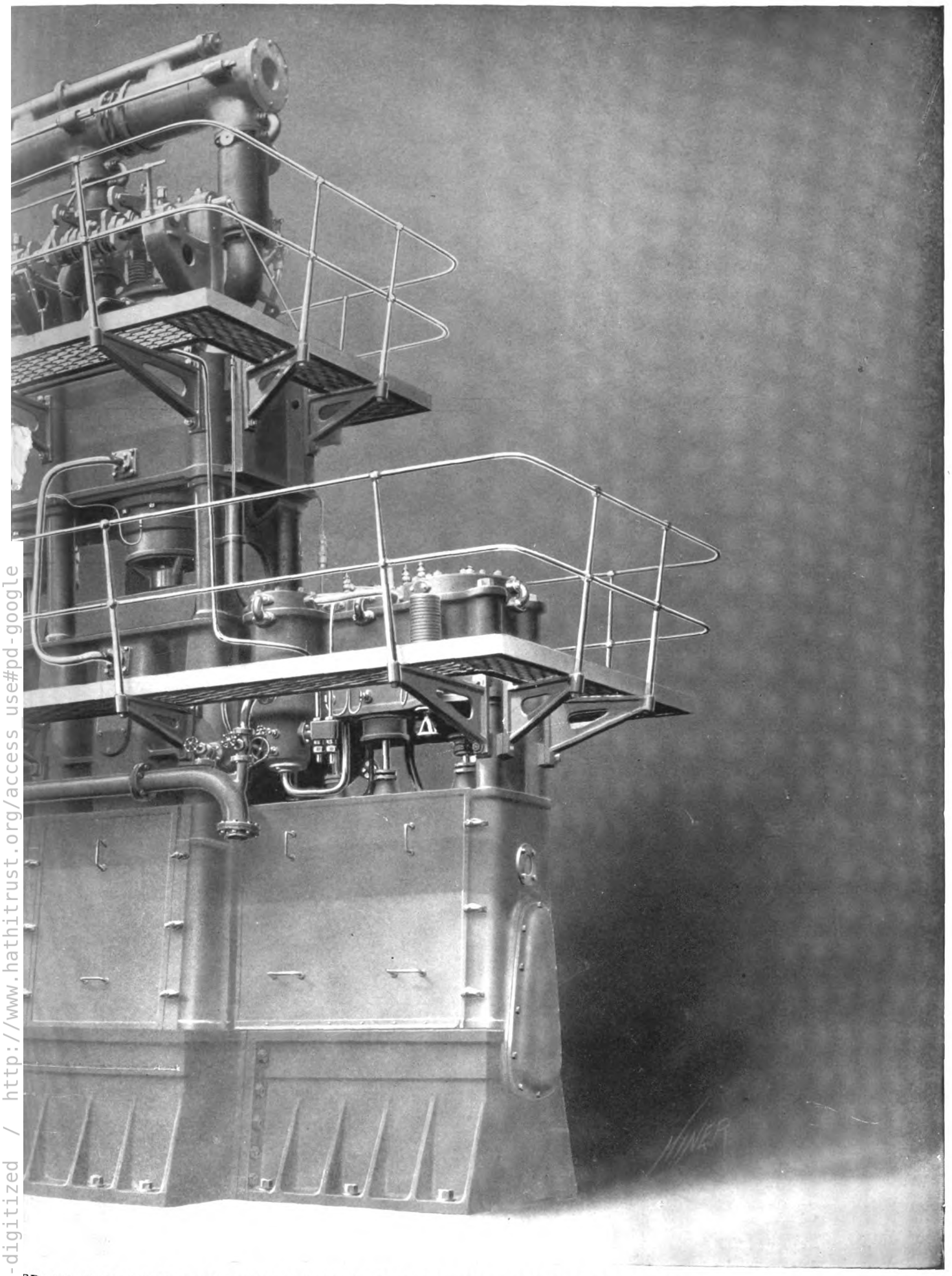
DIESEL ENGINES



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ED IN THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

ENGINE COMPANY

ALIFORNIA

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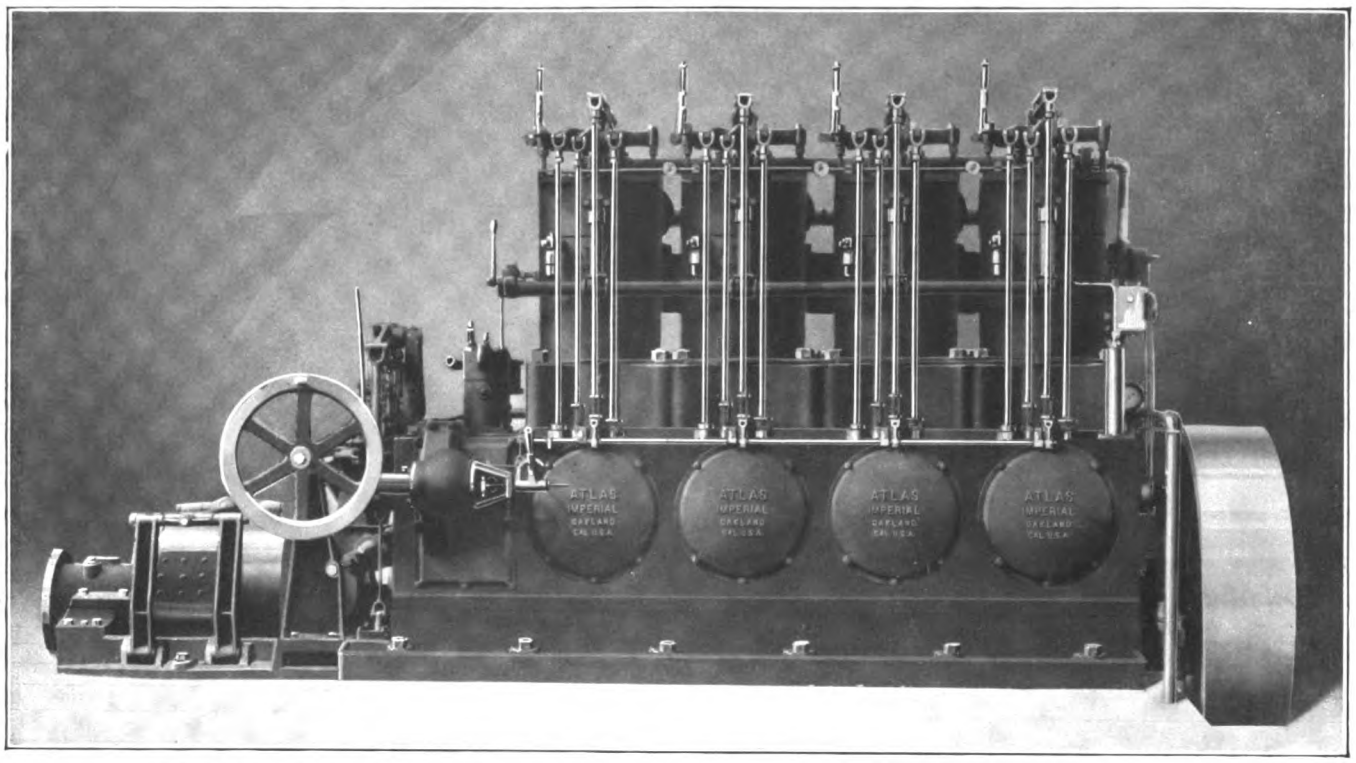

165 H. P. MECHANICAL-INJECTION MARINE DIESEL-ENGINE
BUILT IN 3, 4 and 6 CYLINDER TYPES 55 TO 500 HORSE-POWER

SOME CHARACTERISTICS OF OUR ENGINES:

STARTING:	Is accomplished by compressed-air at 30 to 150 lbs. pressure in 5 to 10 seconds from stone cold to full power.
FUEL INJECTION:	Fuel-oil is injected into the combustion-chamber by mechanical means, no high-pressure air is used.
FUEL IGNITION:	Ignition is accomplished by the heat of compression only, no hot-balls, points, or surfaces of any kind are used.
COMPRESSION:	350 lbs. per square-inch.
FUEL CONSUMPTION:	One gallon of crude-oil for 19 horsepower per hour.
GRADE OF FUEL:	Any grade of fuel-oil is used that will flow readily through the pipes to the engine.
COST OF FUEL:	About 1/10 of a gas-engine.
LUBRICATION:	Return force-feed system to bearings through hollow crank-shaft and connecting-rod. Mechanical feed to cylinders. Consumption 1/10 gallon per 100 H. P. hour.
POWER:	Engines develop 20% in excess of rated power.
GOVERNING:	Gear-driven fly-ball governors regulate the quantity of fuel used, and sensitively controls the speed of the engine from no-load to full-load and vice versa with a variation in speed of not over 5%.
VIBRATION:	Less than a heavy-duty gas-engine.
RELIABILITY:	Absolutely dependable under the most trying conditions.
FLOOR SPACE:	About 15% greater than a heavy-duty gas-engine of same power.
WEIGHT:	Slightly greater than heavy-duty gas-engines of same power.
ACCESSIBILITY:	All parts are easy of access and made interchangeable as far as practical.
MATERIAL & WORKMANSHIP:	Are the highest possible standard for commercial purposes. All parts made from carefully selected material with a view of its special service, carefully machined to jigs and templates and ground and hardened where necessary.
SPEED:	Revolutions can be varied from 80 to 350 per minute.
SALES:	Our sales are rapidly increasing and every engine is giving wonderful service and satisfaction.

* *

Our Diesel engine in your boat will please you and make you money.

REPRESENTATIVES

ASTORIA, ORE.—Atlas-Imperial Engine Agency, 12th and Bond Sts.
HONOLULU, T. H.—H. A. Peterson, Box 155
JUNEAU, ALASKA—Charles G. Warner Company
NEW ORLEANS, LA.—J. G. Davis, 1324 Music St.
NOME, ALASKA—Alaska Lighterage and Commercial Co.
PAPETTE, TAHITI—Et Davio
SAN PEDRO, CAL.—Garbutt & Walch
SEATTLE, WASH.—Atlas Gas Engine Agency, 901 Western Ave.
SUVA, FIJI—Morris Hedstrom, Ltd.
VANCOUVER, B. C.—Ferrier and Lucas

ATLAS IMPERIAL ENGINE COMPANY
OAKLAND, CALIFORNIA

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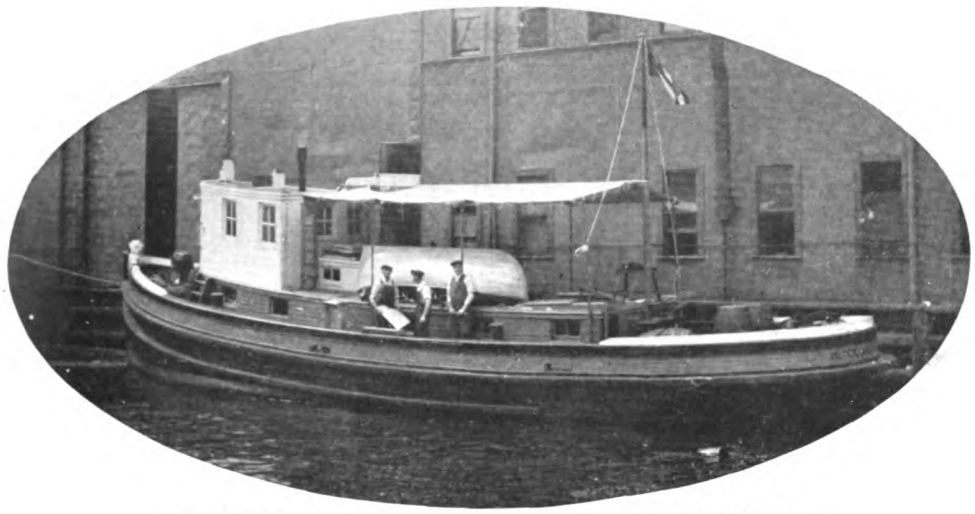
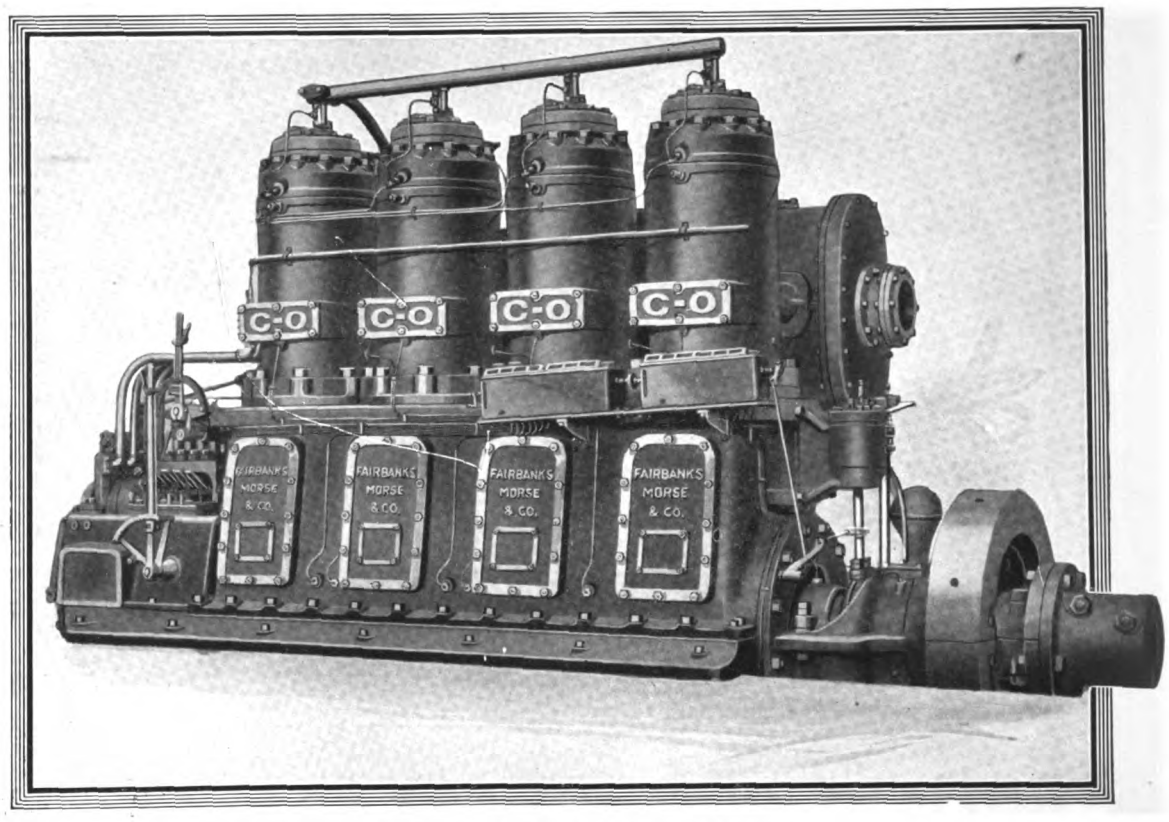
Fairbanks-Morse "C-O" Marine Oil Engines



"Mujuan," owned by the Munson Line of New York, powered with a 100 b.h.p. Fairbanks-Morse C-O engine

"C-O" marine oil engines are maintaining the successful performance records they have built up through years of hard service in over one thousand commercial boat installations — tugs, cargo vessels, lighters, ferries, schooners and workboats of every description. "C-O" engines use low grade fuel oils economically.

Profit Producers for Work-boat Owners



The 100 b.h.p. engine of the tug Mujuan

Fairbanks, Morse & Co.

MANUFACTURERS CHICAGO

The Canadian Fairbanks-Morse Co., Ltd., Montreal

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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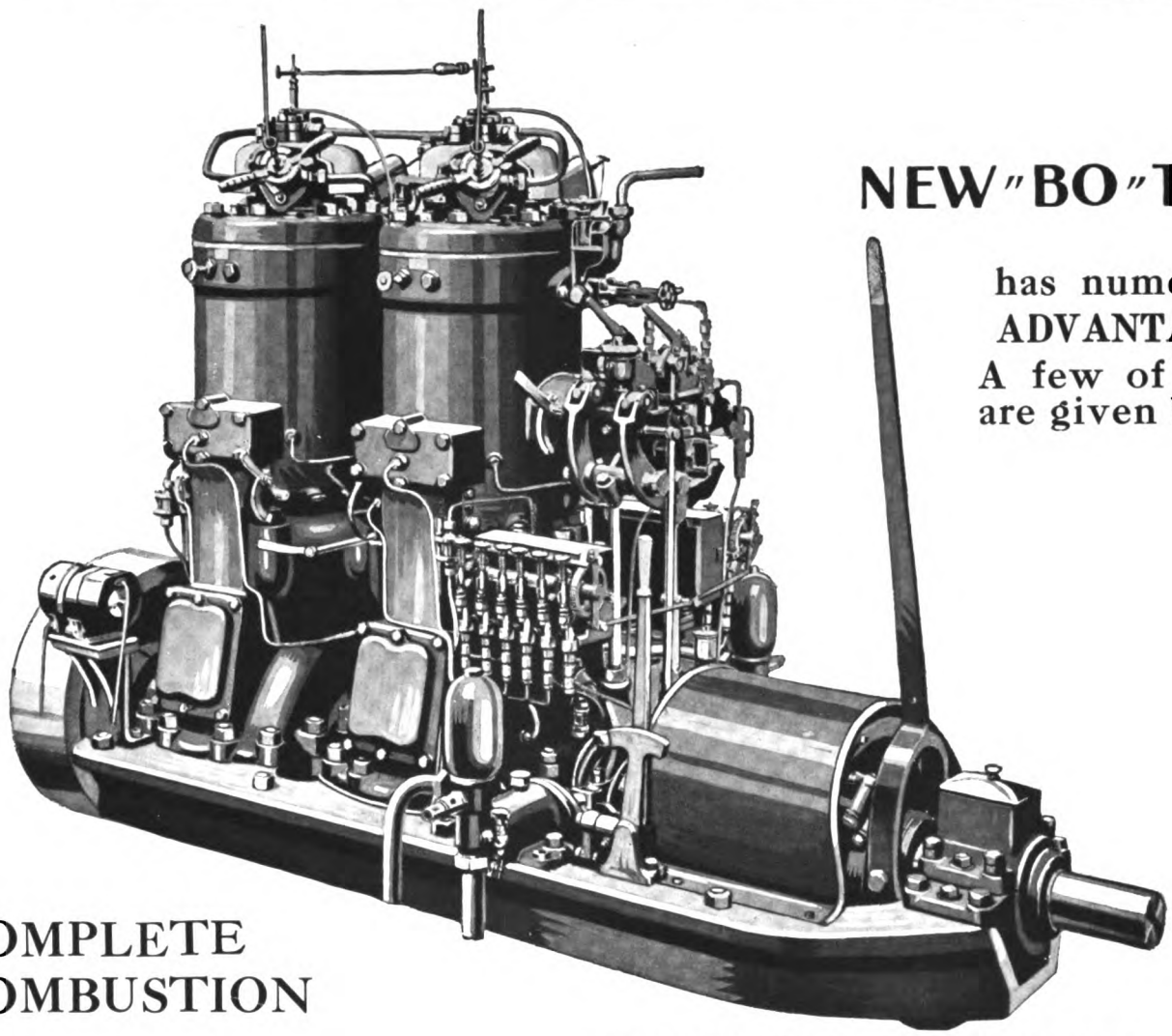
BOLINDERS



NEW "BO" TYPE

has numerous
ADVANTAGES
A few of these
are given below

COMPLETE
COMBUSTION

ELECTRIC QUICK
STARTING DEVICE

NO AIR COMPRESSOR

LOW UPKEEP AND COST
OF OPERATION

HIGHEST GRADE OF
WORKMANSHIP AND
MATERIAL

Sizes from 6 to 500 Brake Horse Power

BOLINDERS COMPANY, Inc., 30 Church St., New York City

BOLINDERS COMPANY, 411 Exchange Building, 53 State Street, BOSTON, MASS.

COMPAÑIA BOLINDER
Avenida de Mayo 560
BUENOS AIRES, ARGENTINA

ROBINSON & HAIGH
Mercaderes 10
HAVANA, CUBA

CARIB TRADING CO.
CARTAGENA, COLOMBIA

FIDANQUE BROS. & SONS
PANAMA, REP. OF PANAMA

HENRY LUND & CO.
Marine Building
SAN FRANCISCO, CAL.

LAMMERS & MAASE, LIMITED
170 McGill Street
MONTREAL, CANADA

ALEXANDER McDOUGALL
ST. JOHN'S, NEWFOUNDLAND

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16 Diesel Engines Placed on Sale

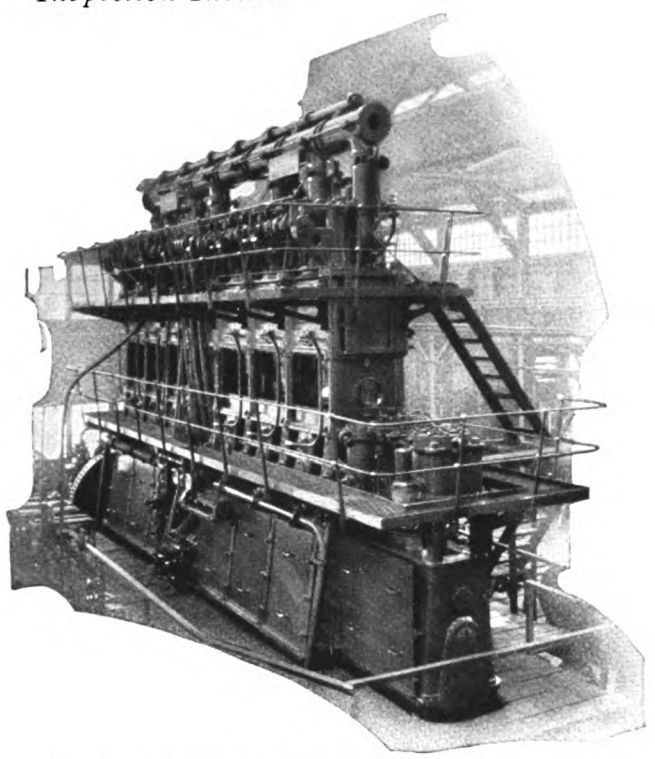
BY THE

UNITED STATES SHIPPING BOARD

Through the United States Shipping Board Emergency Fleet Corporation

Available for Immediate Delivery

Inspection Invited



Engines in Original Crates and now Stored in Warehouse

Ten 825 B.H.P. 135 R.P.M. six cylinder, vertical, single acting, direct reversible four cycle, cross head, heavy duty, **Werkspoor Type Diesel Engine. Scandia Pacific Oil Engine Co., Manufacturer.**

Location: 8 (4 R.H. and 4 L.H.)
Alameda, California.
2 (1 R.H. and 1 L.H.)
Fruitvale, California.

One 900 B.H.P. 140 R.P.M. six cylinder, vertical, single acting, direct reversible, four cycle, cross head, heavy duty, **Swedish "Polar" Type Diesel Engine. McIntosh & Seymour Co., Auburn, N. Y., Manufacturer.**

Location: (1 R.H.)
Hog Island, Pa.

Five 750 B.H.P. 135 R.P.M. six cylinder, vertical, single acting, direct reversible, four cycle, trunk piston, **Swedish "Polar" Type Diesel Engine. McIntosh & Seymour Co., Auburn, N. Y., Manufacturer.**

Location: 4 (2 R.H. and 2 L.H.)
Hog Island, Pa.
1 (R.H.) Erie, Pa.

Inspection Invited

To arrange for inspection of engines located at Alameda and Fruitvale, communicate with

D. H. MEISENBACH, *Sales Manager*, Alameda, California

To arrange for inspection of engines located at Hog Island and Erie, communicate with

J. T. EASON, *Sales Manager*, Hog Island, Pennsylvania

Any or all of these engines will be sold "as is, where is" and without warranty as to condition, quality or capacity. The United States Shipping Board Emergency Fleet Corporation will load on cars at its expense at the above locations. Engines are offered subject to prior sale or other disposition.

For additional information, communicate with F. H. WALSH, Manager, Material Sales Division

U. S. SHIPPING BOARD EMERGENCY FLEET CORPORATION
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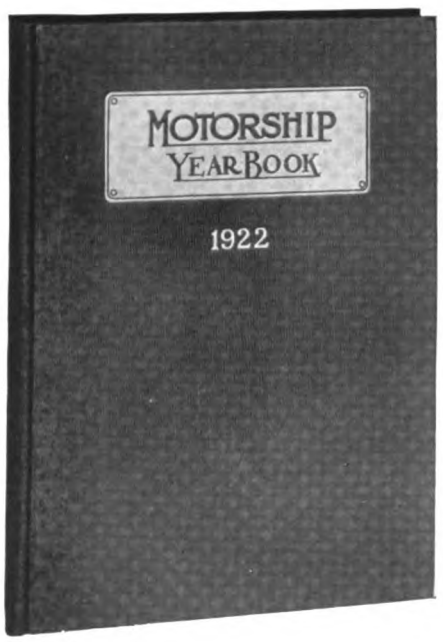
INVALUABLE TO DESIGNERS, BUILDERS, OPERATORS, AND MOTORSHIP ENGINEERS



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The Central Power Plant

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—applied to the modern ship

The modern ship is a complete city—independent, self-contained.

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The central power plant is now indispensable to our industrial and our home life, because it has solved the problems of economical production and multiplied home comforts through the resulting labor saving devices.

Who thinks now of the shop with an independent engine on each machine? This troublesome and wasteful practice was abandoned years ago.

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The Central Power Plant, generating electricity economically, and transmitting it conveniently by cable to individual-motor-driven deck and other auxiliaries, as well as to the propelling motors, will aid materially in effecting a competitive merchant marine.

Generators driven by Diesel engines—the most economical prime mover known—form the ideal central power plant, with its attendant ease of control and simplicity and economy of operation.

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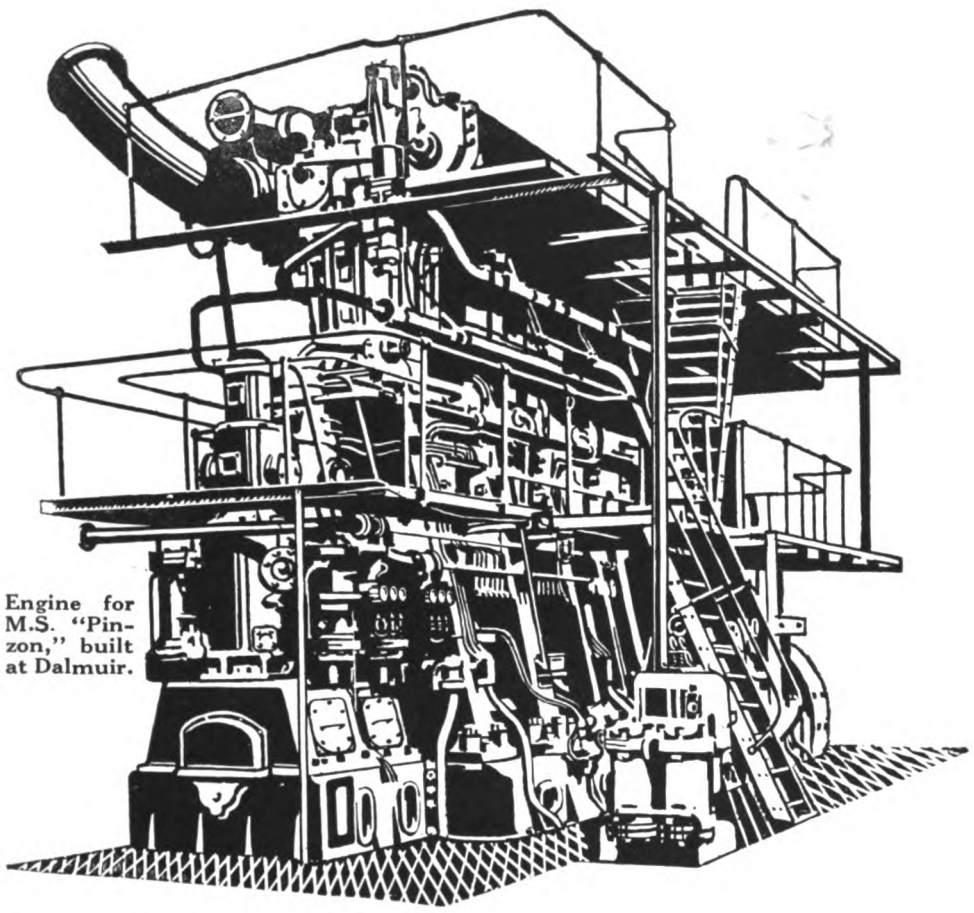
BEARDMORE TOSI DIESEL *Marine Engine*

THE ENGINE THAT REPRESENTS THE GREATEST ADVANCE IN DESIGN AND IN MARINE PROPULSION



Engine for M.S. "Pinzon," built at Dalmuir.

Results of 100 Hours' Trial.

Average B.H.P.	1,276
Mechanical efficiency, per cent.	77
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Revolutions per minute	124
Mean pressure on B.H.P. basis, lb. per square inch	75.5
Fuel consumption, lb. per P.H.P. per hour	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. Fah.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average	125
Piston cooling water, outlet temperature, deg. Fah., average	130
Blast air pressure, lb. per square inch	1,000

Extract from THE ENGINEER, November 11th, 1921.

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

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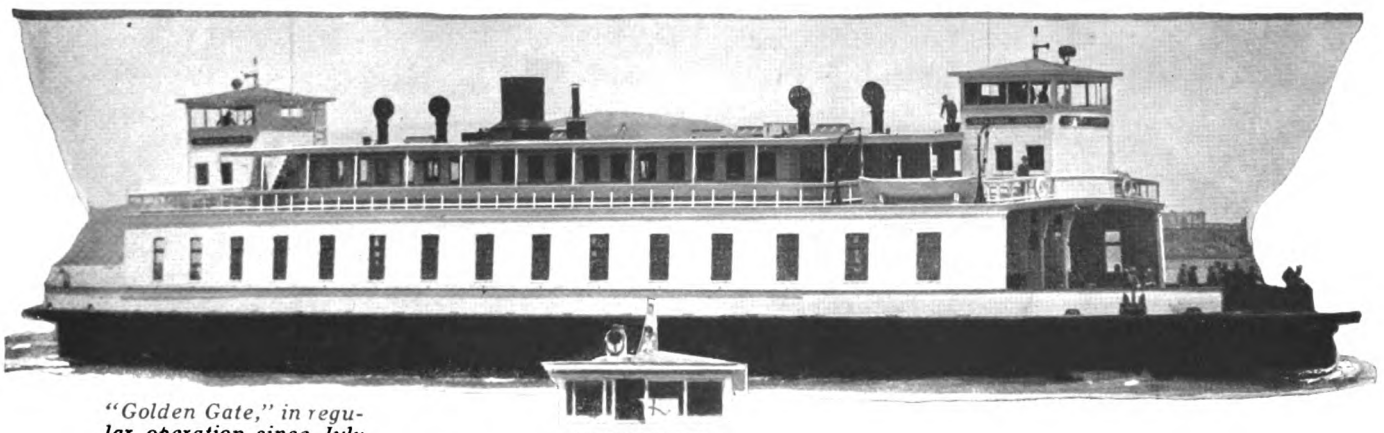
First Diesel Engine-Electric Drive Ferry



"Golden Gate," in regular operation since July 4. — James Robertson, Marine Architect.

Double-end Propulsion

Diesel Engine-Electric Drive was chosen for the "Golden Gate," the first double-end screw propeller ferry with each propeller driven independently.

Double-end propulsion is most economical when all the propelling power is concentrated on the aft propeller. Electric drive is the only means to accomplish this, using one prime mover for both directions of travel.

G-E Electric Drive for motor ships is available in any capacity required. Installations have already proved successful on ships regularly engaged in commercial fishing and cargo service.

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UNDER THE B. & W. SYSTEM
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THE NUMBER OF SUCCESSFUL
MOTORSHIPS IN OPERATION
EXCEED ALL OTHER
SYSTEMS COMBINED
AND NO ENGINE BUILT
TO THIS SYSTEM HAS
EVER BEEN REMOVED
OR REPLACED

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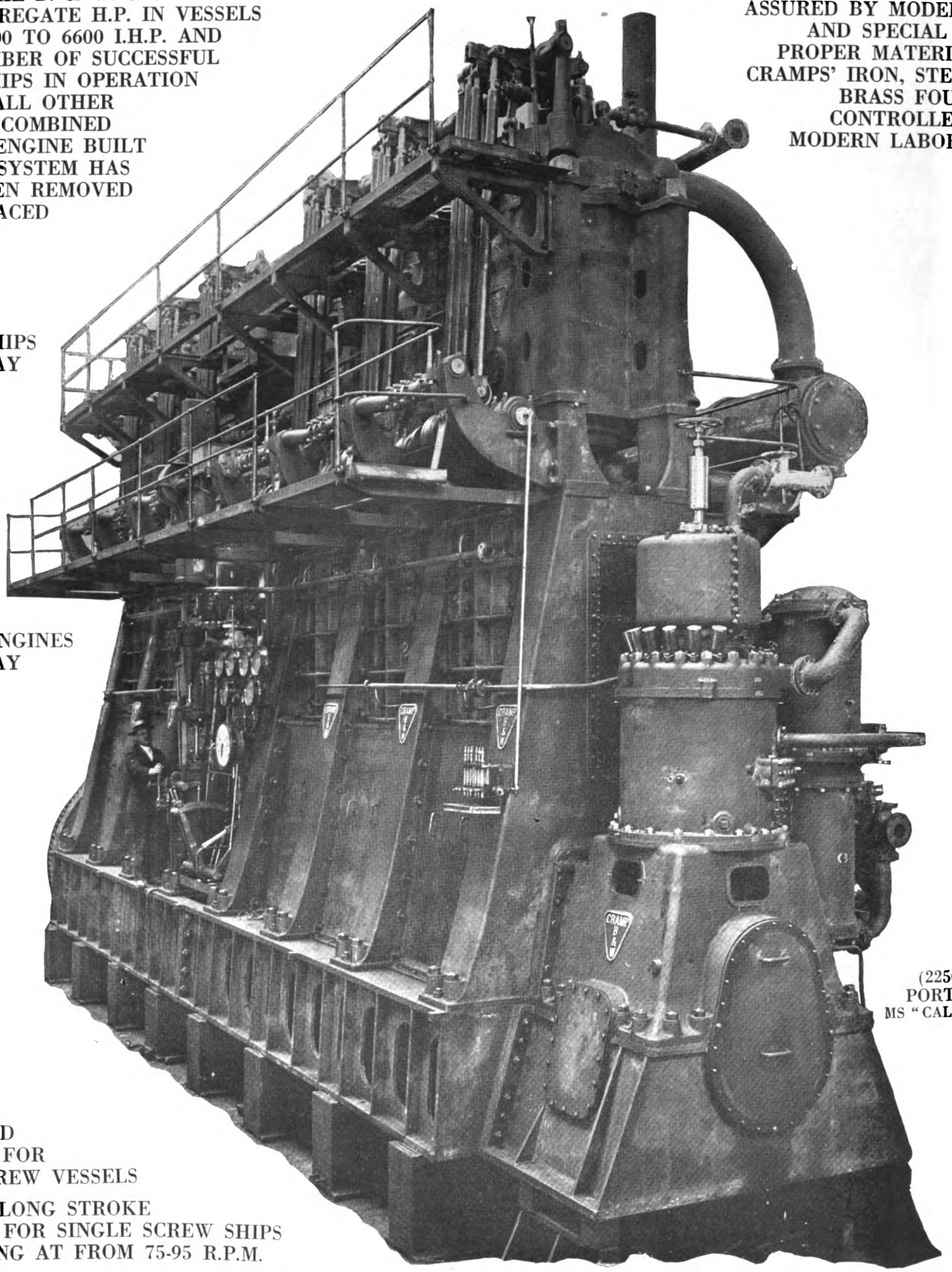
ASSURED BY MODERN JIGS
AND SPECIAL TOOLS;
PROPER MATERIALS BY
CRAMPS' IRON, STEEL AND
BRASS FOUNDRIES
CONTROLLED BY A
MODERN LABORATORY

MOTORSHIPS
THAT STAY
ON THE
SEAS

DIESEL ENGINES
THAT STAY
IN THE
SHIPS



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PORT ENGINE
MS "CALIFORNIAN"

STANDARD
ENGINES FOR
TWIN SCREW VESSELS

SPECIAL LONG STROKE
ENGINES FOR SINGLE SCREW SHIPS
OPERATING AT FROM 75-95 R.P.M.

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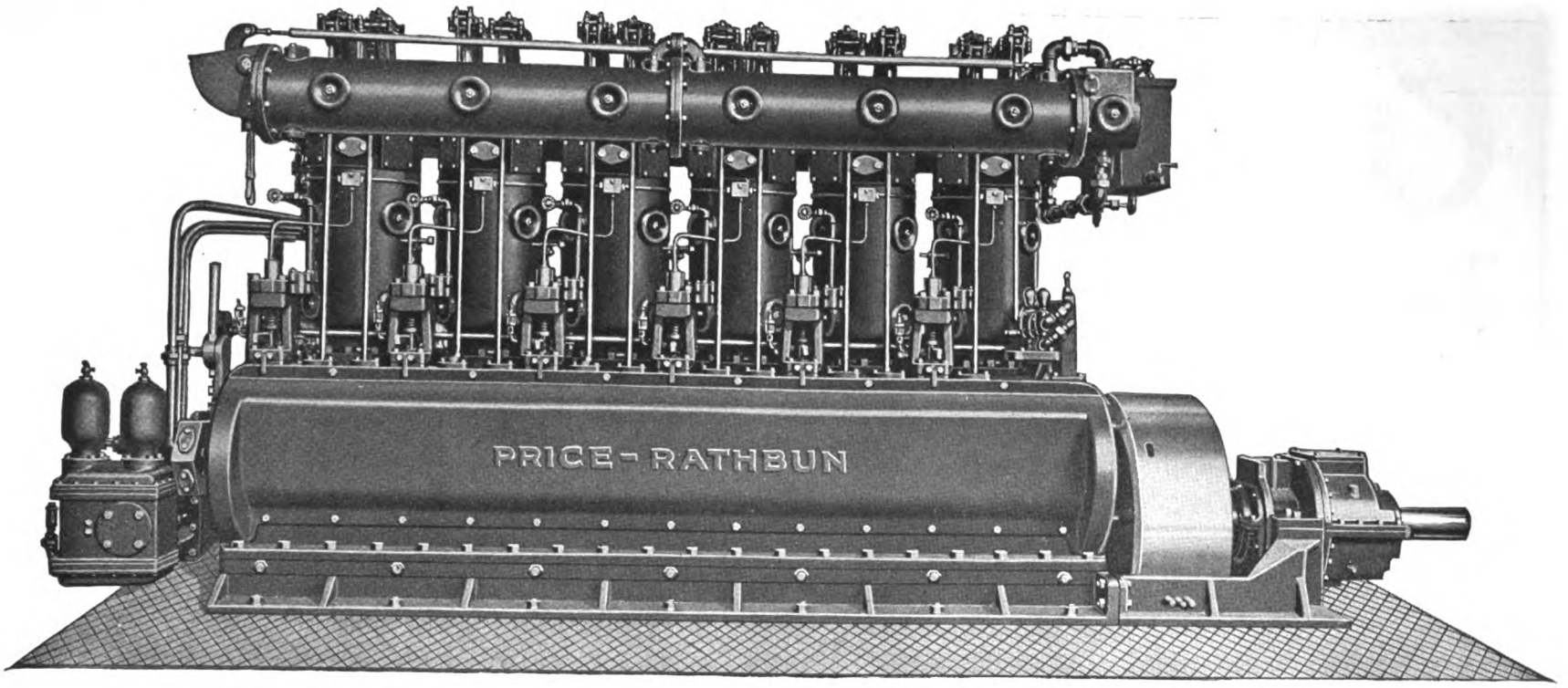

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In most cases any oil engine must compete with steam engine or turbine drive and stand the test of engineering comparison.

Compare the Price Oil Engine with other types of drive from the following three angles:

Cost of prime mover and necessary auxiliaries.
Consumption and cost of fuel and lubrication.
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Price Oil Engines have direct-injection of fuel without the use of compressed air. The elimination of the high-pressure injection air compressor increases the engine's mechanical efficiency and materially reduces the possibility of breakdown.

Ignition is by heat of compression only—there are no hot bulbs, plates or liners.

The guaranteed fuel oil consumption of Price Engines is 0.45 pounds per brake horse power hour. The guaranteed lubricating oil consumption is one gallon per 4000 horse power hours.

The selection of materials and the conservative design and rating of Price Engines insure long life and freedom from breakdown.

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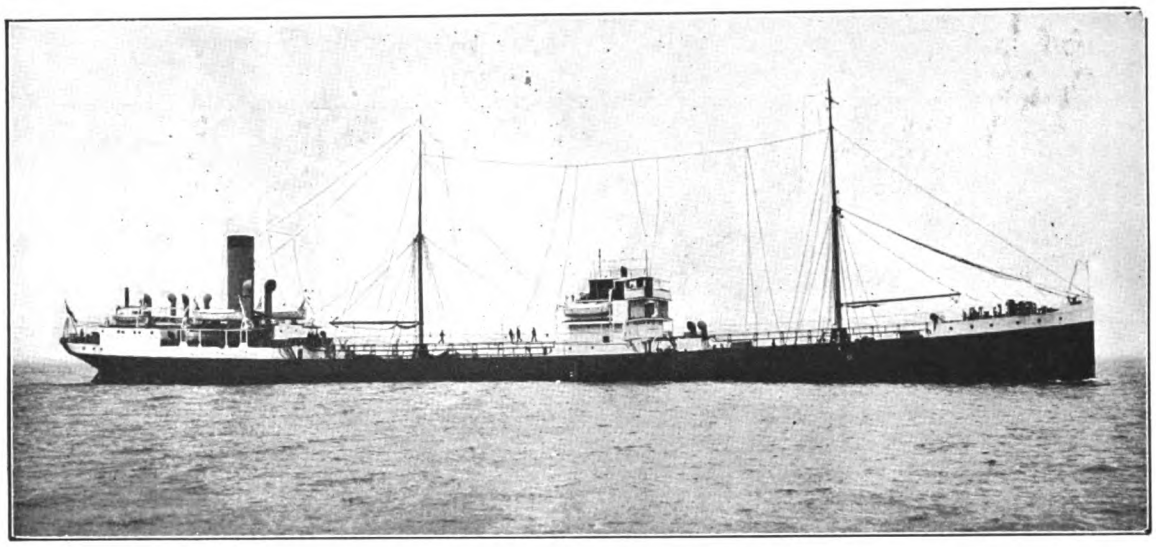

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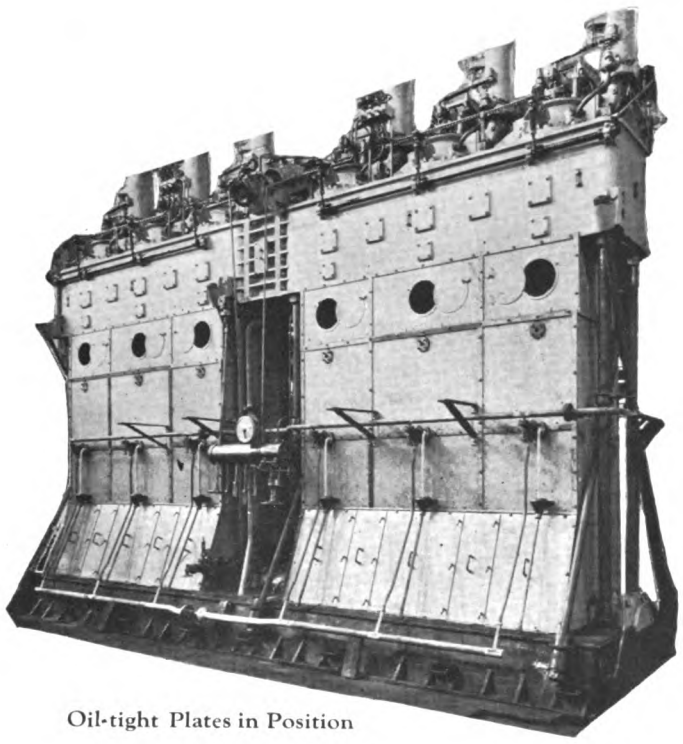
Condemn The Engine—



Oil-tight Plates in Position

that has vital parts which can't be replaced without the help of the builders in any port of the world.

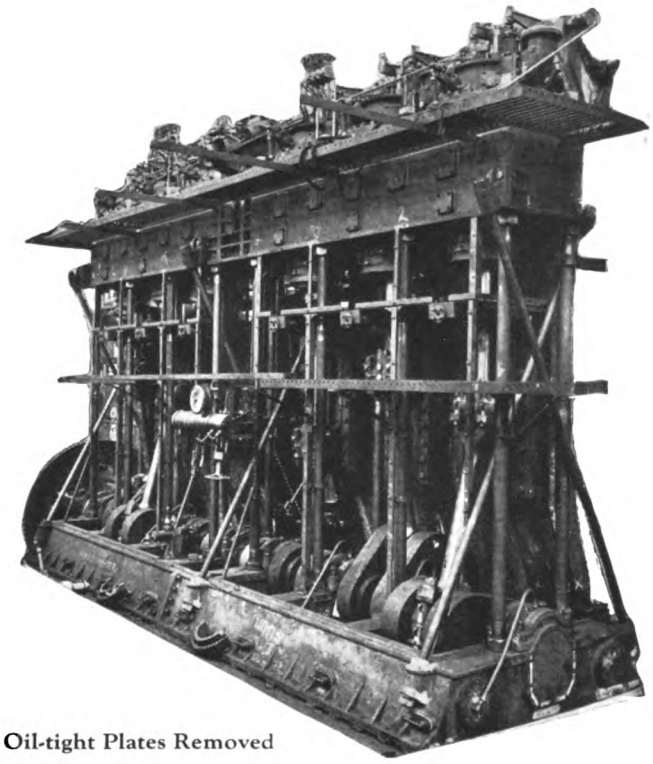
Condemn the Engine—

which presents itself nicely to the eye, but which is a perfect monster if you want to get at the cross-head-pins.

If You Don't—

it will condemn itself in a few years at your expense.

M. O. Torian in Motorship, January, 1920.



Oil-tight Plates Removed

Note the Remarkable

accessibility features of the Werkspoor four-cycle type Diesel marine oil engine illustrated on this page. No need to break pipes and a score of joints to get at the important parts. Can be repaired at any port.

Your Ships Should Have WERKSPOOR ENGINES

Application for information regarding Additional American Marine and Stationary Diesel Constructional Licenses should be made to

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United States Agent for

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Accessibility Means Reliability

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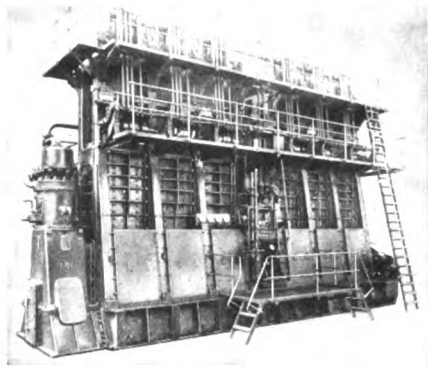
BURMEISTER & WAIN, LIMITED

SINGLE SCREW MOTOR SHIP "LEISE MÆRSK"

ENGINEERS & SHIPBUILDERS

COPENHAGEN, DENMARK

THE LONG STROKE SLOW RUNNING ENGINE INSTALLED IN THE M/S *"LEISE MÆRSK"*



THIS TYPE OF ENGINE IS ESPECIALLY ADAPTABLE FOR SINGLE SCREW CONVERSION JOBS

UP TO JUNE, 1922 PUT IN ACTUAL SERVICE **91** MOTORSHIPS WITH ENGINES OF THE B & W TYPE TOTALLING **1,108,934** TONS DISPLACEMENT

NAME OF VESSEL	Loaded Displ.
ABA	14660
AFRIKA	19000
AMERICA	10660
ANNAM	14000
ARATOR	10400
ASIA	15000
AUSTRALIEN	14100
BALBOA	13500
BALZAC	2250
BATAVIA	2250
BAYARD	8430
BINTANG	5100
BONHEUR	15000
BORGLAND	10660
BRAZIL	6755
BUENOS-AIRES	13500
BULLAREN	13500
CALIFORNIA	12100
CANADA	13500
CANTON	14400
CHILE	14450
COLUMBIA	14450
COMETA	9780
DINTELDIJK	19100
DORSETSHIRE	15500
ELMAREN	13500
FALSTRIA	11000
FIONIA	10800
FORMOSA	15000
FRITIOF	1000
FRITZOE	1484

NAME OF VESSEL	Loaded Displ.
FRATELLI BANDIERA	10525
GEORGE WASHINGTON	15000
GLENADE	13640
GLENAMOY	13800
GLENAPP	19100
GLENARIFFE	13640
GLENARTNEY	13800
GLENAVY	11000
GLENBEG	19100
GLENGARRY	19100
GLENGYLE	13400
GLENLUCE	13640
GLENOGLE	19100
GLENTARA	13640
HEMLAND	11500
INDIEN	12180
JAVA	19000
JULIUS SCHINDLER	6200
KANGAROO	11000
KEDOE	9800
KRONPRINSESSAN MARGARETA	9700
KRONPRINS GUSTAF ADOLF	9700
KOBENHAVN	7900
LA PAZ	13640
LAPONIA	11700
LEIGHTON	15200
LEISE MÆRSK	6350
LIMA	9700
LINNELL	15200
LOBOS	13600
LOCHKATRINE	19100

NAME OF VESSEL	Loaded Displ.
LOSADA	13600
LOUISIANA	13858
MALAKKA	14100
MALAYA	19000
MISSISSIPPI	11177
OREGON	12350
OSSAG	6200
PACIFIC	9700
PANAMA	14100
PEDRO CHRISTOPHERSEN	9700
PERU	14450
POLARHAVET	10585
SAN FRANCISCO	9700
SELANDIA	10525
SIAM	14000
SOMERSETSHIRE	15780
SONGDAL	7300
SONGVAND	7300
SONGVARD	7300
STRASSA	11700
STUREHOLM	11100
SUECIA	9700
SULINA	6400
TENERIFFA	15025
THEODORE ROOSEVELT	15100
TISNAREN	13500
TONKING	14100
VALPARAISO	9700
WILLIAM PENN	17100

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THE WM. CRAMP & SONS CO.
PHILADELPHIA, PA., U. S. A.

U. S. REPRESENTATIVE for B. & W.
H. C. HALLINGS
27 WHITEHALL STREET, NEW YORK

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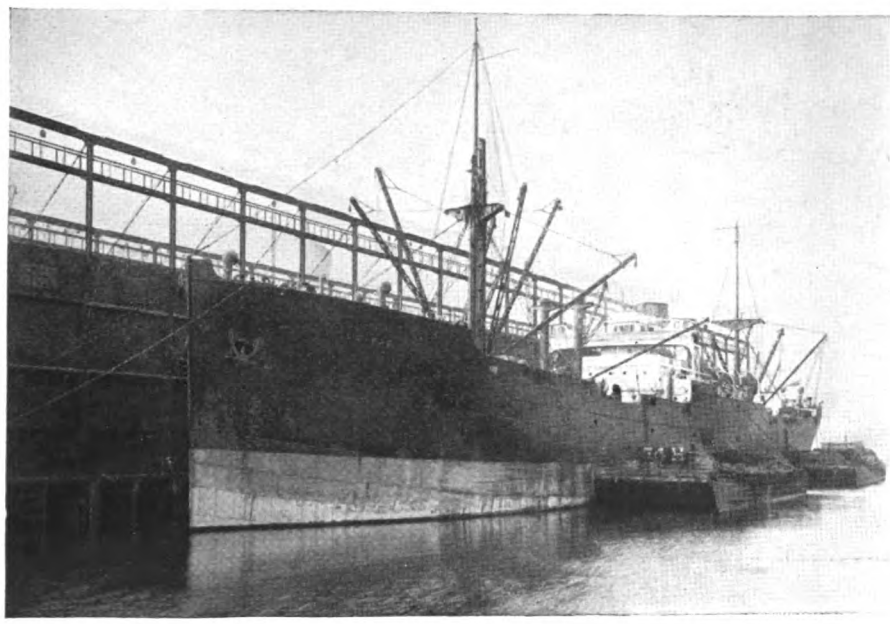

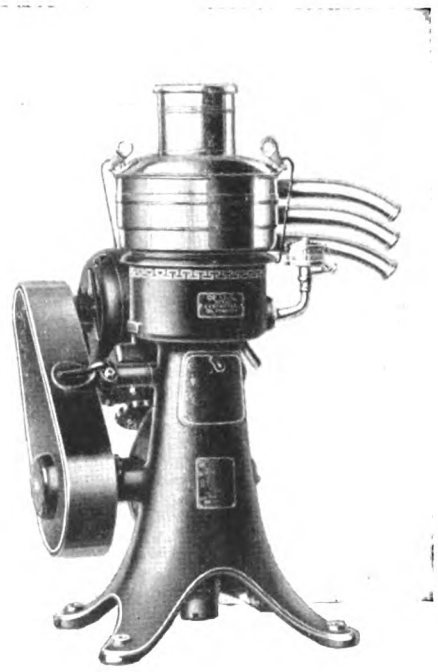

Diesels on Motorship "La Paz" get better lubrication at less cost

The "La Paz"—first of a fleet of six motorships built by the Pacific Steam Navigation Co.—has a permanent guarantee against lubricating trouble. The De Laval Oil Purifier that is installed as a part of her engine room equipment will always keep her lubricating oil clean—no matter how long in use.

Scored and burned-out bearings and undue wear on gears can be avoided on your ship by installing a De Laval Oil Purifier. Sludge and emulsions become only memories, as does the fact that you used to pump oil overboard after a short period of use.

The oil you save and the longer service you get from machinery combine to pay the cost of installing a De Laval—usually in a few months.

Bulletin 103 covers the steam field. Bulletin 102 describes the application of De Laval Purifiers in handling crankcase oils. Write for the one in which you are interested.

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway **Chicago, 29 East Madison St.**

De Laval Pacific Company, San Francisco, Cal.
Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a

De Laval

Please send Bulletins telling how De Laval Oil Purifiers improve the operation of ships' engines and lower lubricating costs, with particular reference to the type of engine checked.

☐ Turbine ☐ Diesel

Name .....

Company .....

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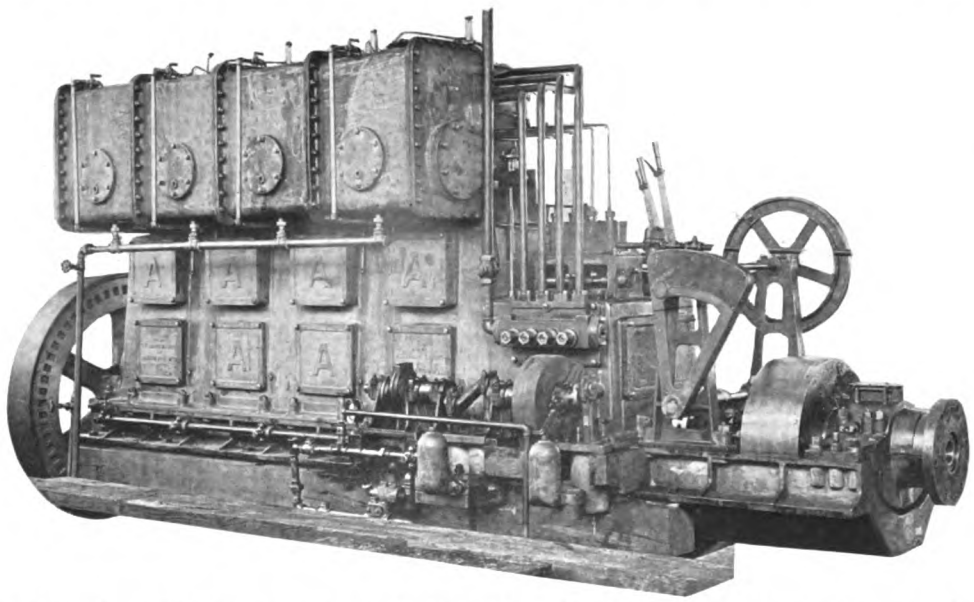
The Adams Diesel Engine



A simple, solidly constructed full Diesel Engine. Operates on the two stroke cycle with mechanical atomization and mechanical injection of the fuel.

Burns the standard asphalt base fuel oils of fourteen to twenty-six baume, completely and with high economy.

Simple to operate, easy to care for, it is an engine which may be depended upon for uninterrupted service.

E. T. ADAMS & SONS, LOS ANGELES, CALIF.

Mail address Box 20, Huntington Park, Calif.

THE

MOTORSHIP YEAR BOOK

Absolutely indispensable to the owner and builder alike

THE only complete Annual Blue Book covering the essential facts of the motor-shipping industry. Embraces the principal and important engineering facts and data, as well as the products of the principal manufacturers of engines of motorships.

The most valuable and authoritative data yet compiled. Contains, among a host of other useful features, complete information of every one of the 800 motorships that have been built from the first ship down to the present time. It is a reference and guide for future and present construction, and is of inestimable value to the whole shipping world as well as the oil-engine industry.

Genuinely worth ten times its cost of

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THE MANUAL OF MOTOR SHIPPING

And an Annual Review

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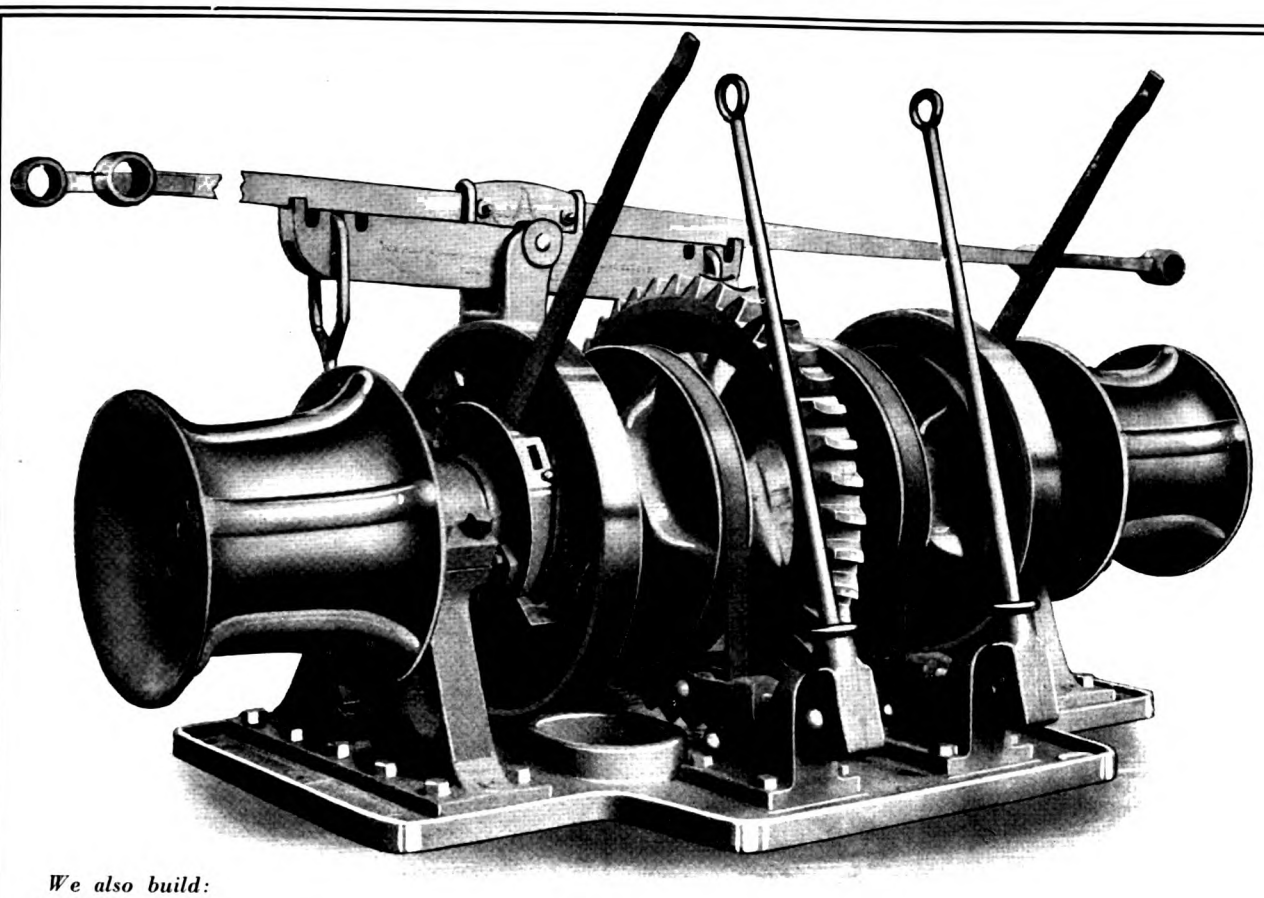

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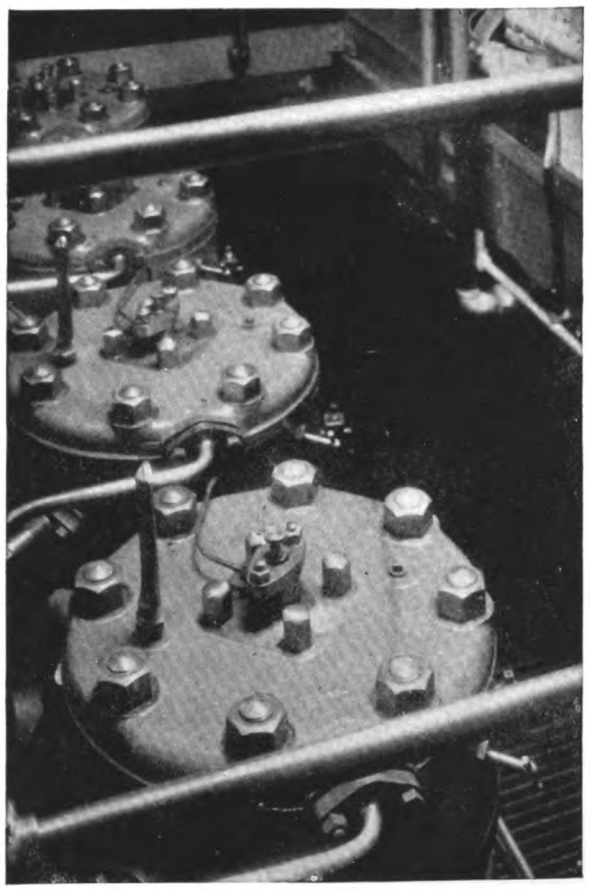

Cylinder heads of Worthington Diesel Engine, two-cycle, solid injection, installed in motor lighter Worthington.

No Moving Parts On Cylinder Heads

The photograph shows just one of the simplicity features of the Worthington Diesel Engine, two-cycle, solid injection type. The nearest moving part here is a little check valve in the fuel oil spray nozzle. Nothing on top the cylinder moves, or wears, when the engine is running.

WORTHINGTON

W 86.4

Worthington Pump and Machinery Corporation
Executive Offices
115 Broadway, New York City. Branch Offices in 24 Large Cities

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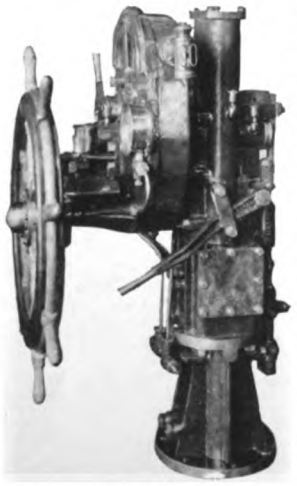

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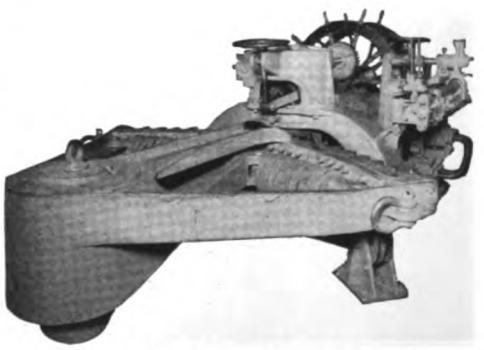

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My Dear Mr. Browner: -

The Glencove, since having the 100 HP "WESTERN" Diesel Engine installed, has been in operation for three months. During this time the Engine has operated so successfully that I feel that I should write you in order that you may know what the Engine is doing.

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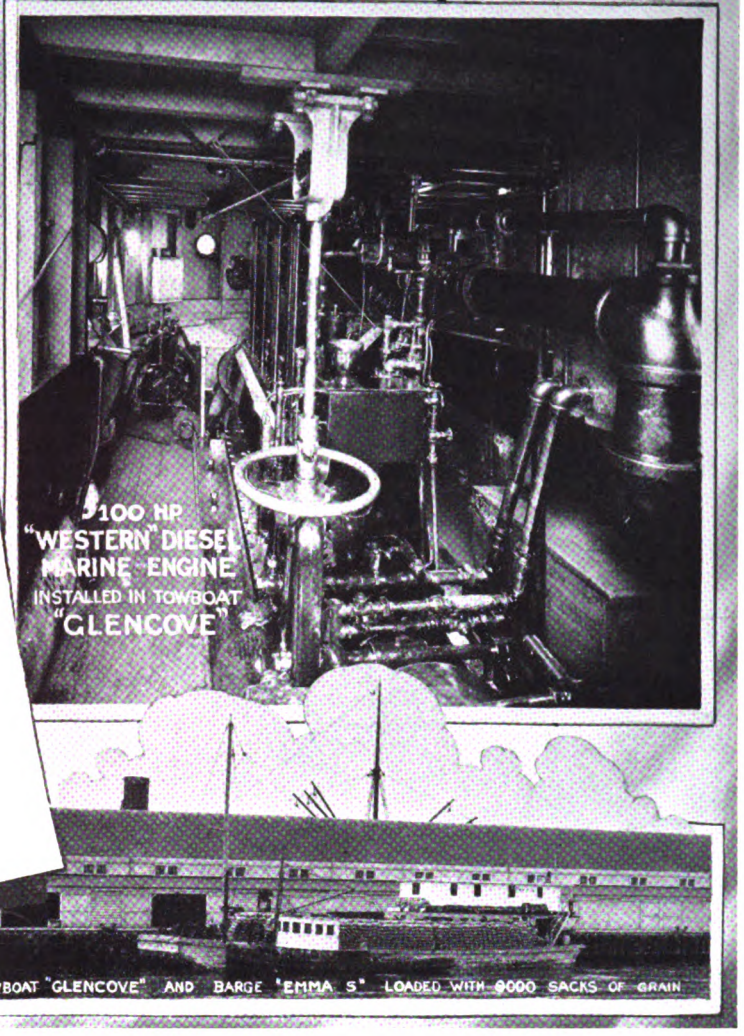
While we have had some minor troubles, which can be expected of any new installation, they have been so small, and really less than I anticipated, that they really do not amount to anything.

In conclusion I might state that I am very well pleased with our installation and that you are at liberty to refer to me at any time for recommendations. Also I wish to take this opportunity of thanking the Western Machinery Company for the excellent service that they have given, and also you personally for the interest you have shown in this installation.

With kindest regards, I remain

Very truly yours,

Capt A. F. Scott



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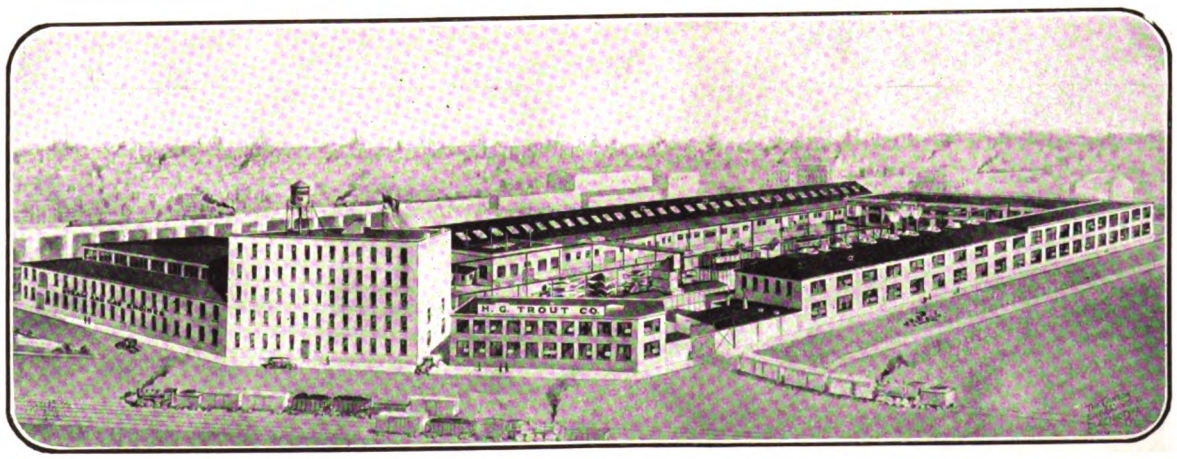

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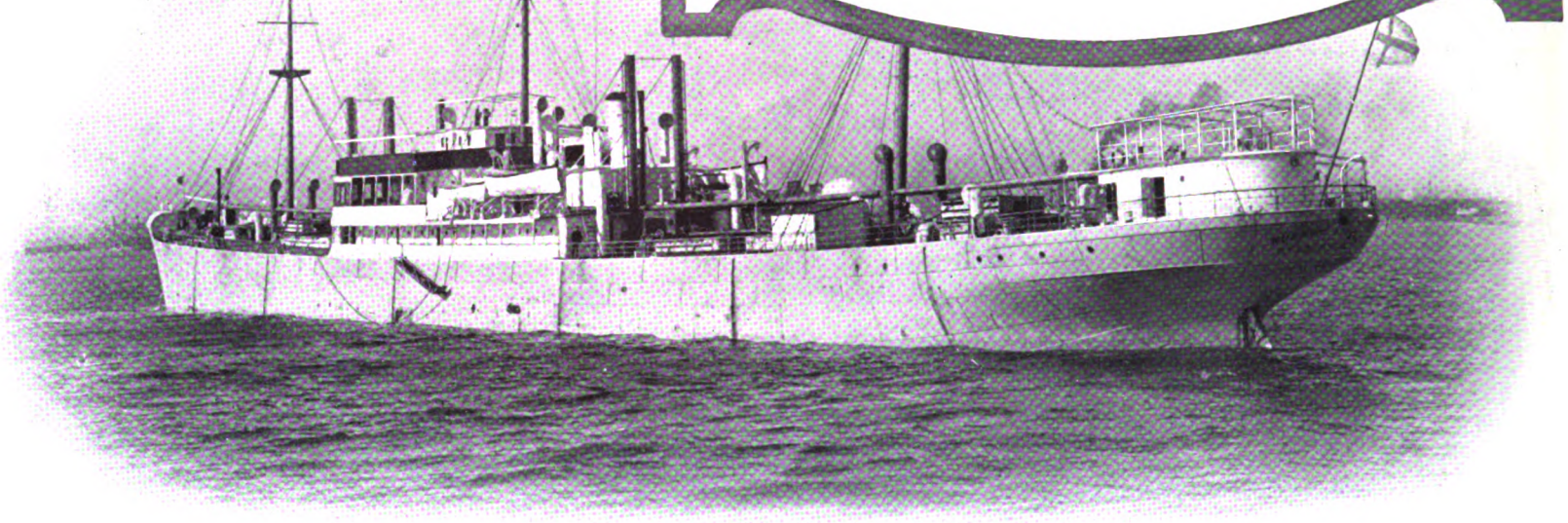

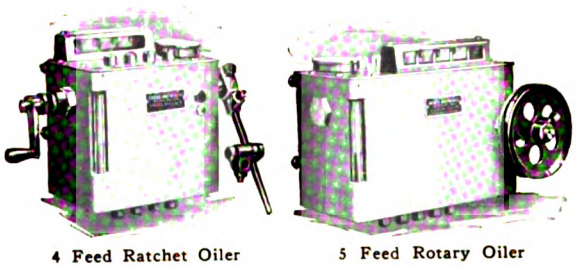

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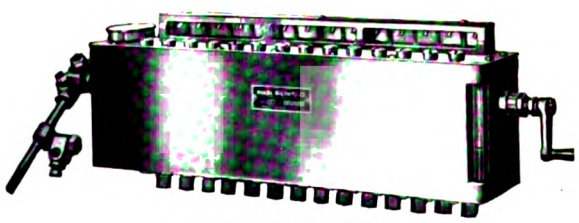

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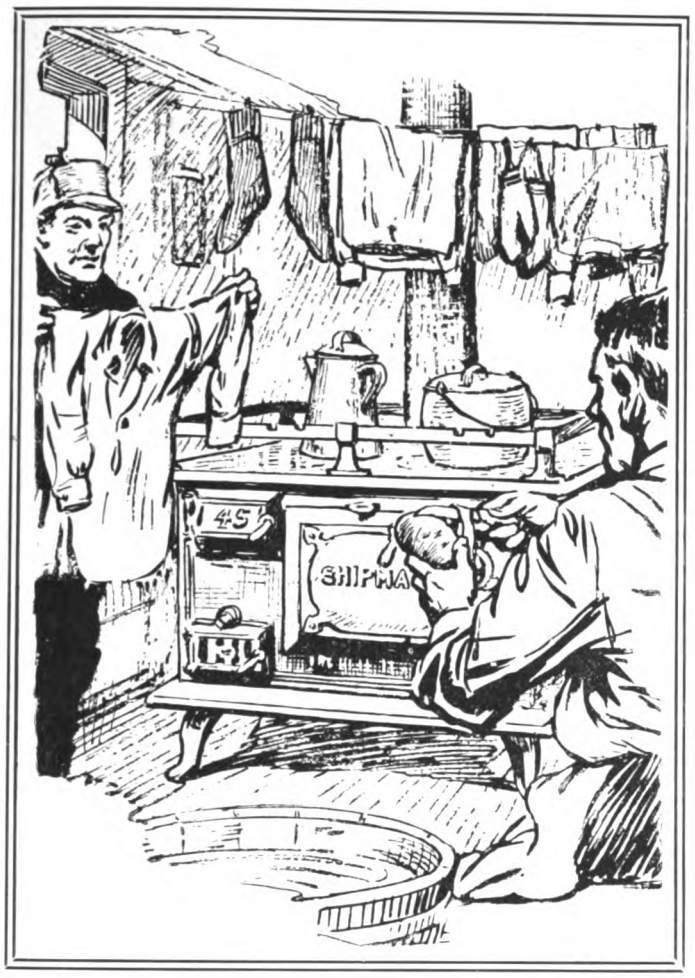

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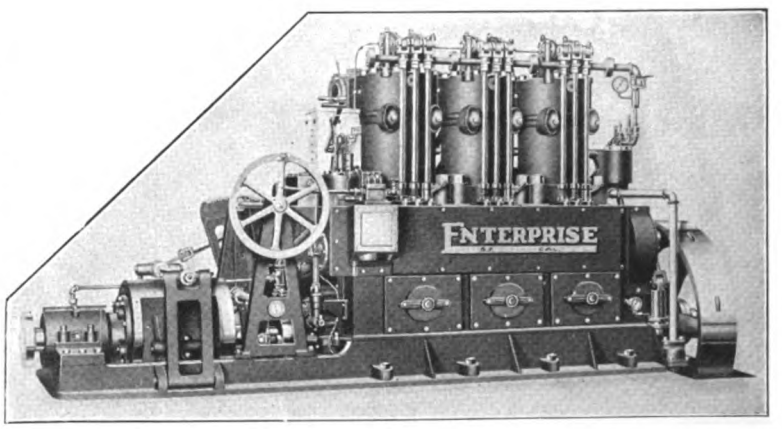

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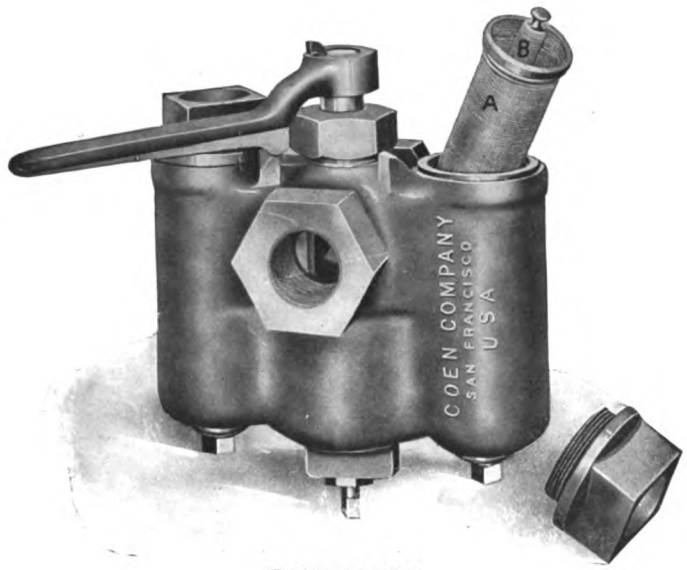

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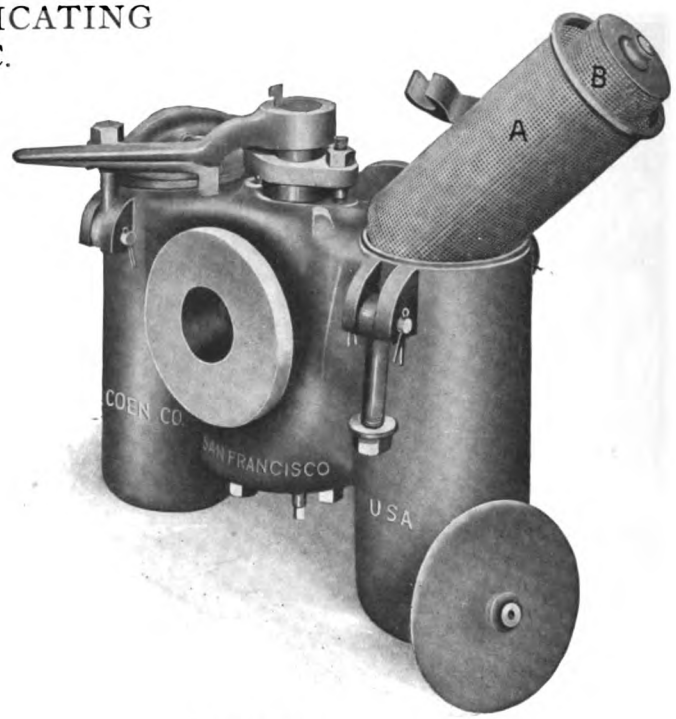

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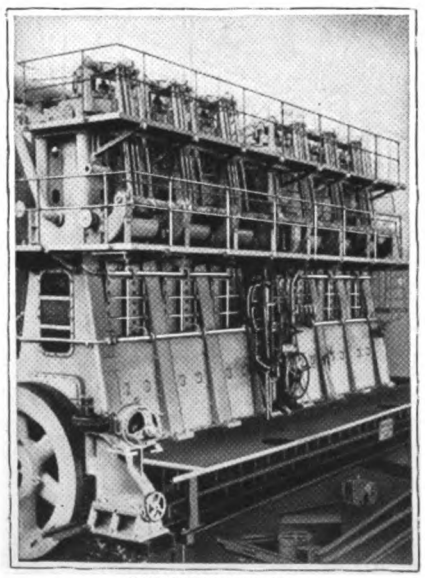

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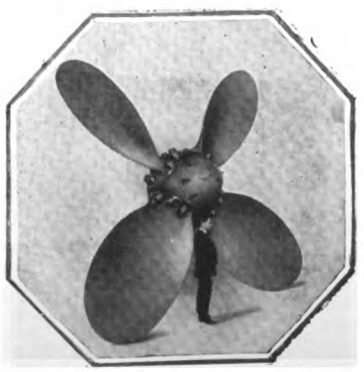

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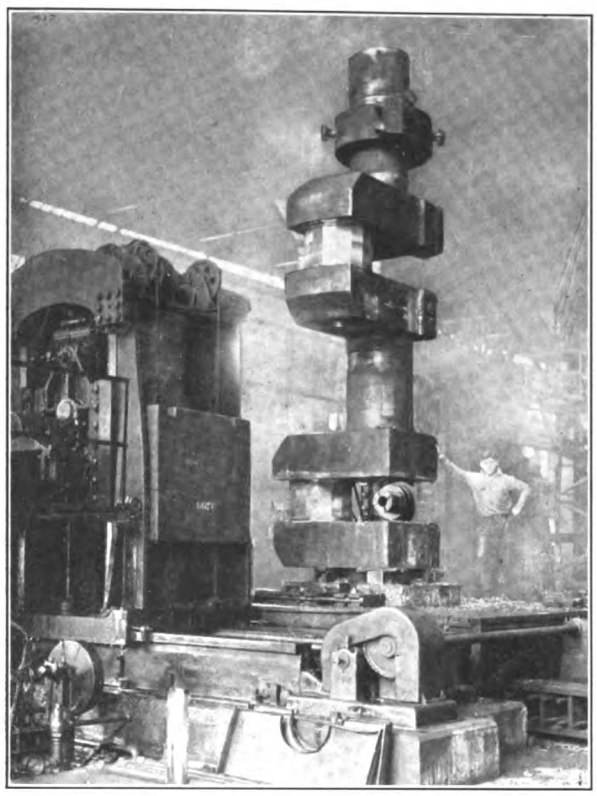

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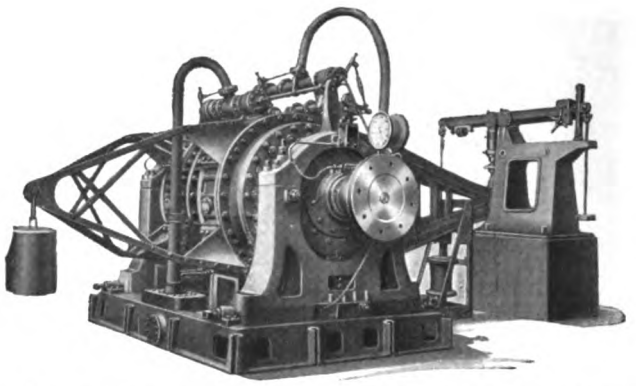

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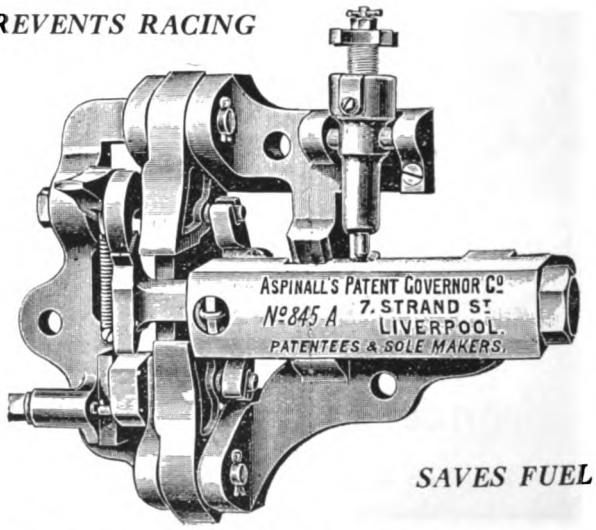

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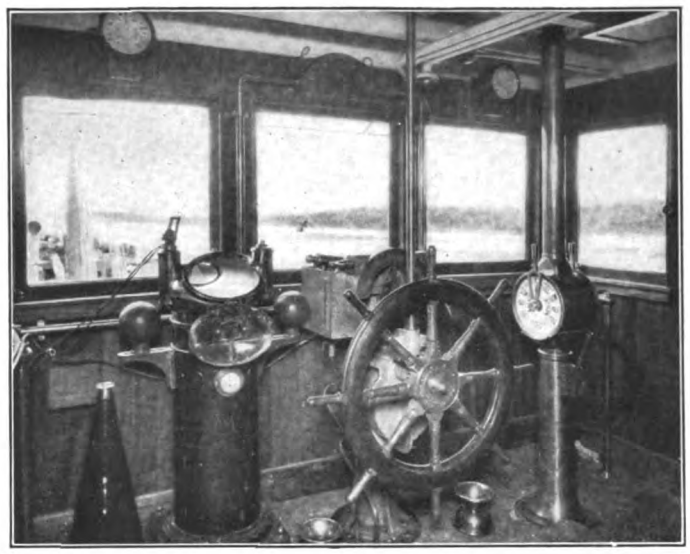

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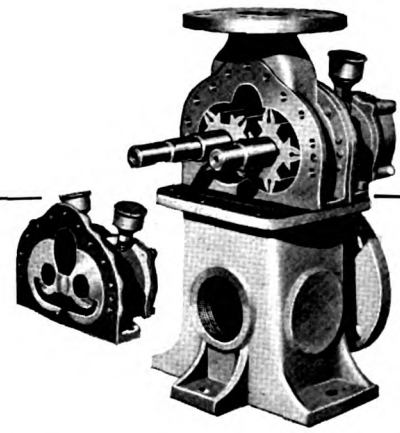

Wear Automatically Taken Up In Northern Rotary Pumps

The rotors in Northern Rotary Pumps are fitted with self-adjusting packing strips which automatically feed out as they wear.

The rotors are relieved of the wear of driving each other by a pair of hardened steel pilot gears running in a bath of oil.

NORTHERN ROTARY PUMPS

"MORE GALLONS PER HORSE POWER"

These Northern features give the pump great advantages—long life at high efficiency—minimum upkeep expense, and "More gallons per horsepower," during the entire life of the pump.

These and other superiorities, like extreme compactness, durability and lightness make the Northern an unusually good cargo pump.

NORTHERN FIRE APPARATUS CO.

MINNEAPOLIS, MINNESOTA. U.S.A.

John A. Hense, New York City, Manager
51 East Forty-second Street

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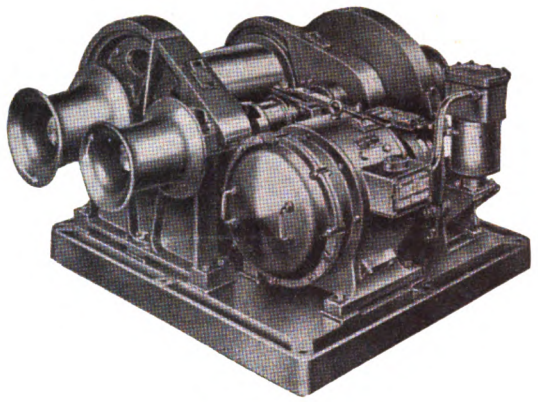


ELECTRIC CARGO WINCHES

The

MAXIM SILENCER

Can Now Be Obtained by MARINE ENGINE BUILDERS

The Maxim Silencer principle has now been developed for silencing the exhaust of large and small internal combustion engines, including for high-powered Diesel motors.

SHIPOWNERS should insist that builders fit Maxim Exhaust-Gas Silencers on all oil-engine installations. The safe navigation of motorships depends upon it. The navigation work—particularly in harbors—must not be interfered with by noisy exhausts.

OVER ONE-HUNDRED INSTALLATIONS IN SUCCESSFUL SERVICE

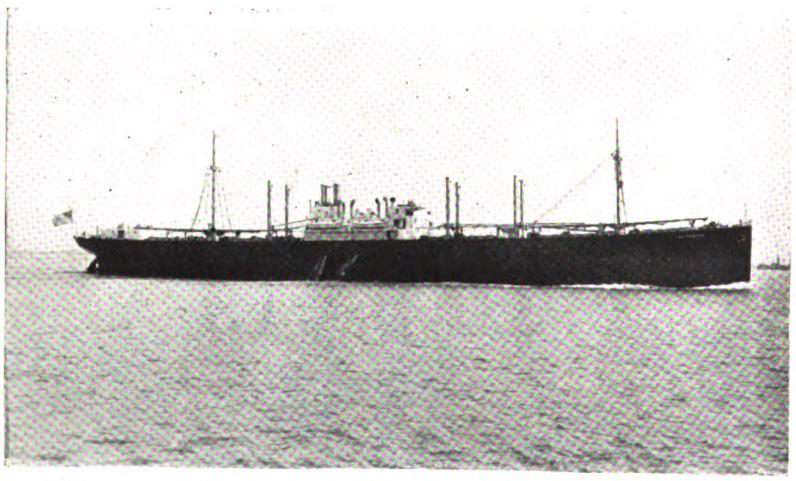
Write for Information

Silencer in engine-room of American motorship "Cethana"

THE MAXIM SILENCER COMPANY

107 Homestead Avenue
HARTFORD, CONN., U. S. A.

(107)



Have the Reputation of Dependability:

Those who know of the reputation of the ships built at Roach's Shipyard, say our recently constructed vessels show a continuance of the same high standards of construction and installation and the same degree of service which gained for Roach's Shipyard the enviable reputation of dependability.

We solicit the opportunity to quote upon new construction, repairs and reconditioning of all types of commercial ships.

Roach's Shipyard

Merchant Shipbuilding Corporation

Chester, Pa. or 39 Broadway, New York

A Large Quantity of New Deck and Engine-Room Equipment and Interior Fittings

is required

for converting 19 American Steamers to Diesel-Engine Power and for 41 new Motorships

(See page 680 September issue)

Advertise Now in

MOTORSHIP

and Secure Your Share of the Business

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BUILDERS OF ALL
TYPES OF VESSELS

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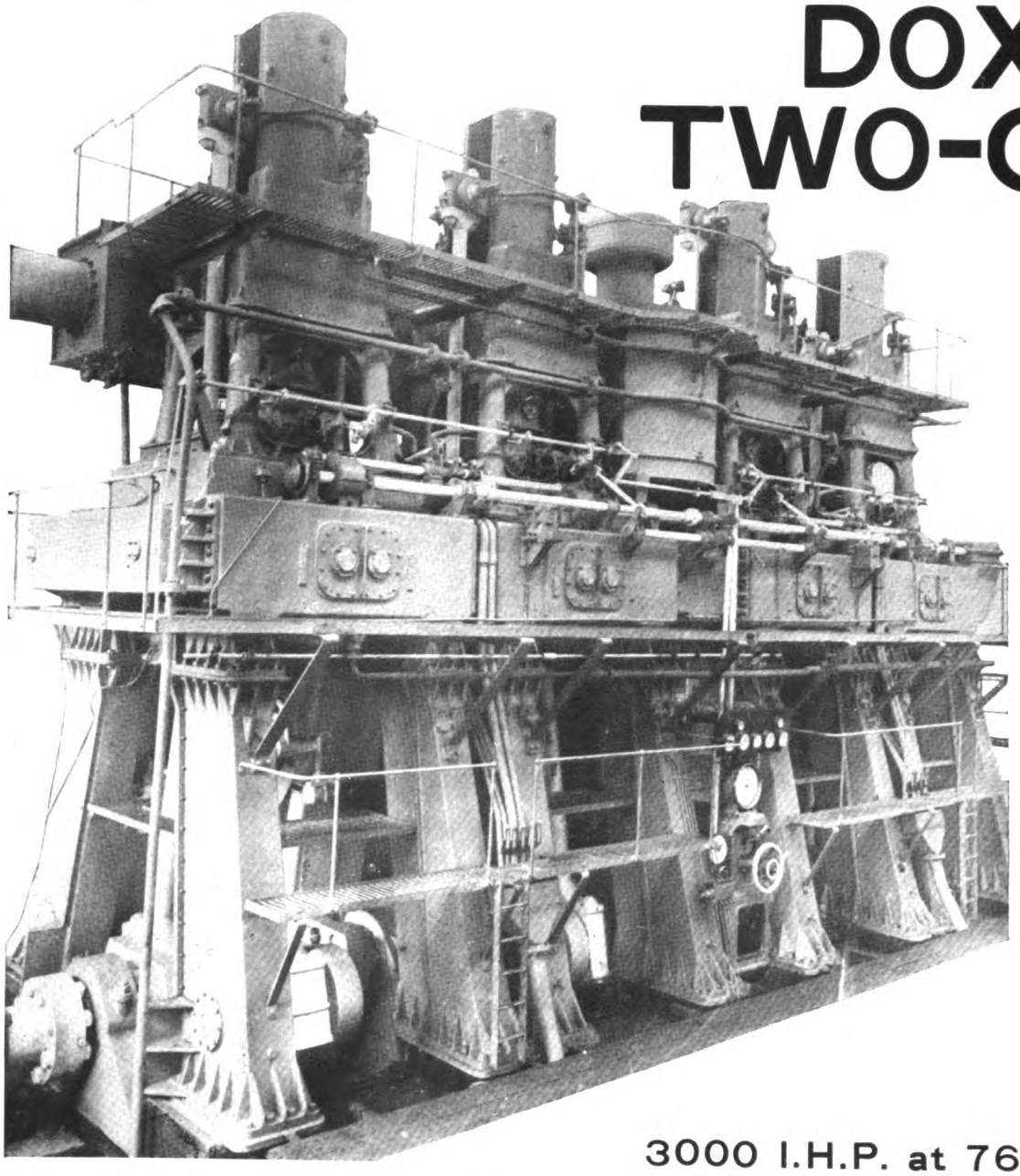
DIESEL

BUILDERS AND

DOXFORD
TWO-CYCLE



3000 I.H.P. at 76 R.P.M.
ON SINGLE SCREW

DOXFORD AND

MOTORSHIP "DOMINION MILLER"

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FINANCE BUILDING

MAIN OFFICE
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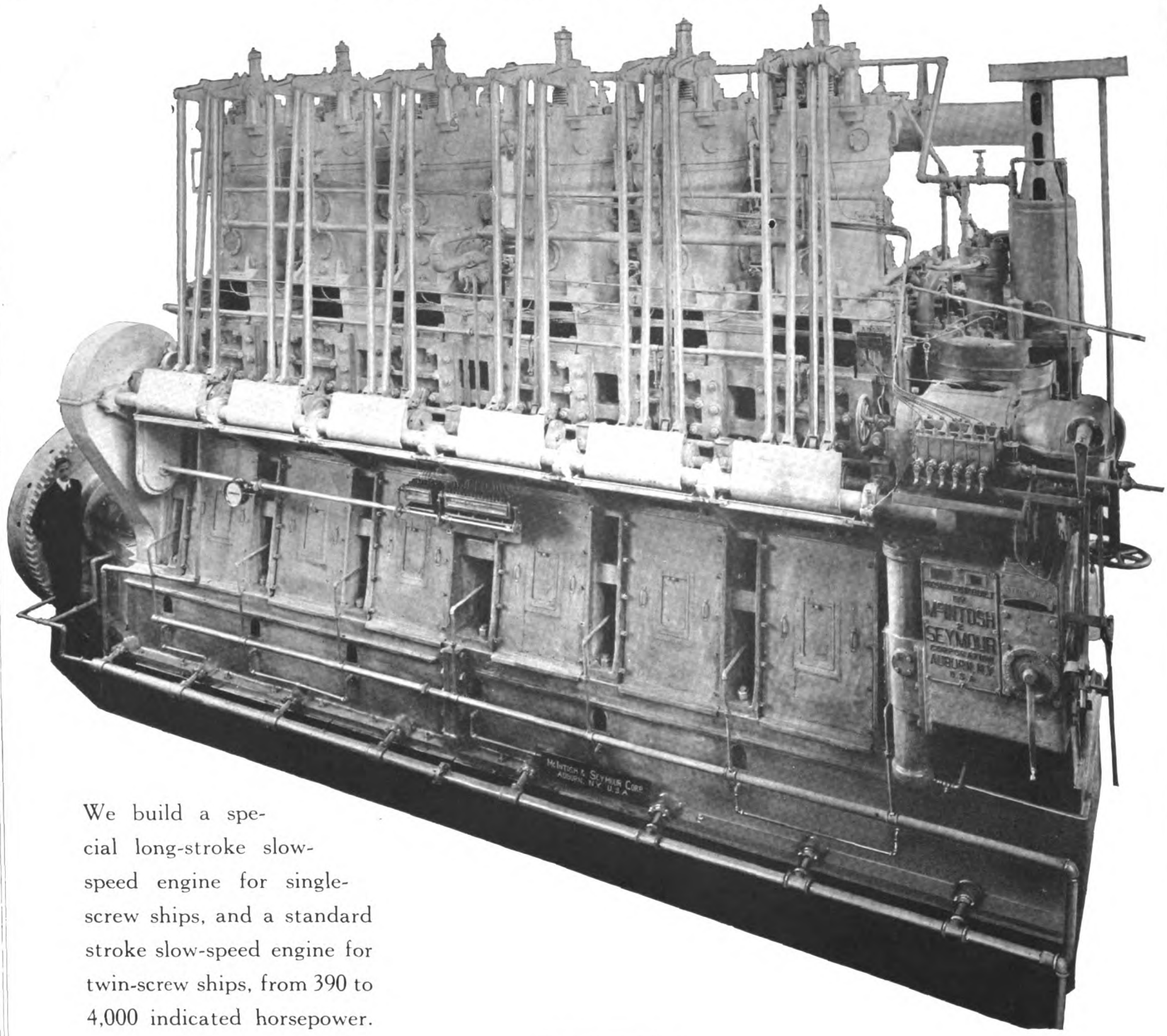

We build a special long-stroke slow-speed engine for single-screw ships, and a standard stroke slow-speed engine for twin-screw ships, from 390 to 4,000 indicated horsepower.

Let us send you our bulletin No. 66, "Achievements in Motor Ships."

(1,200 I.H.P.)
PORT ENGINE
"MS. KENNECOTT"
illustrated on the front cover of this magazine.

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San Francisco, Calif.

412 BISBEE BLDG.
Jacksonville, Fla.

700 INTERSTATE BLDG.
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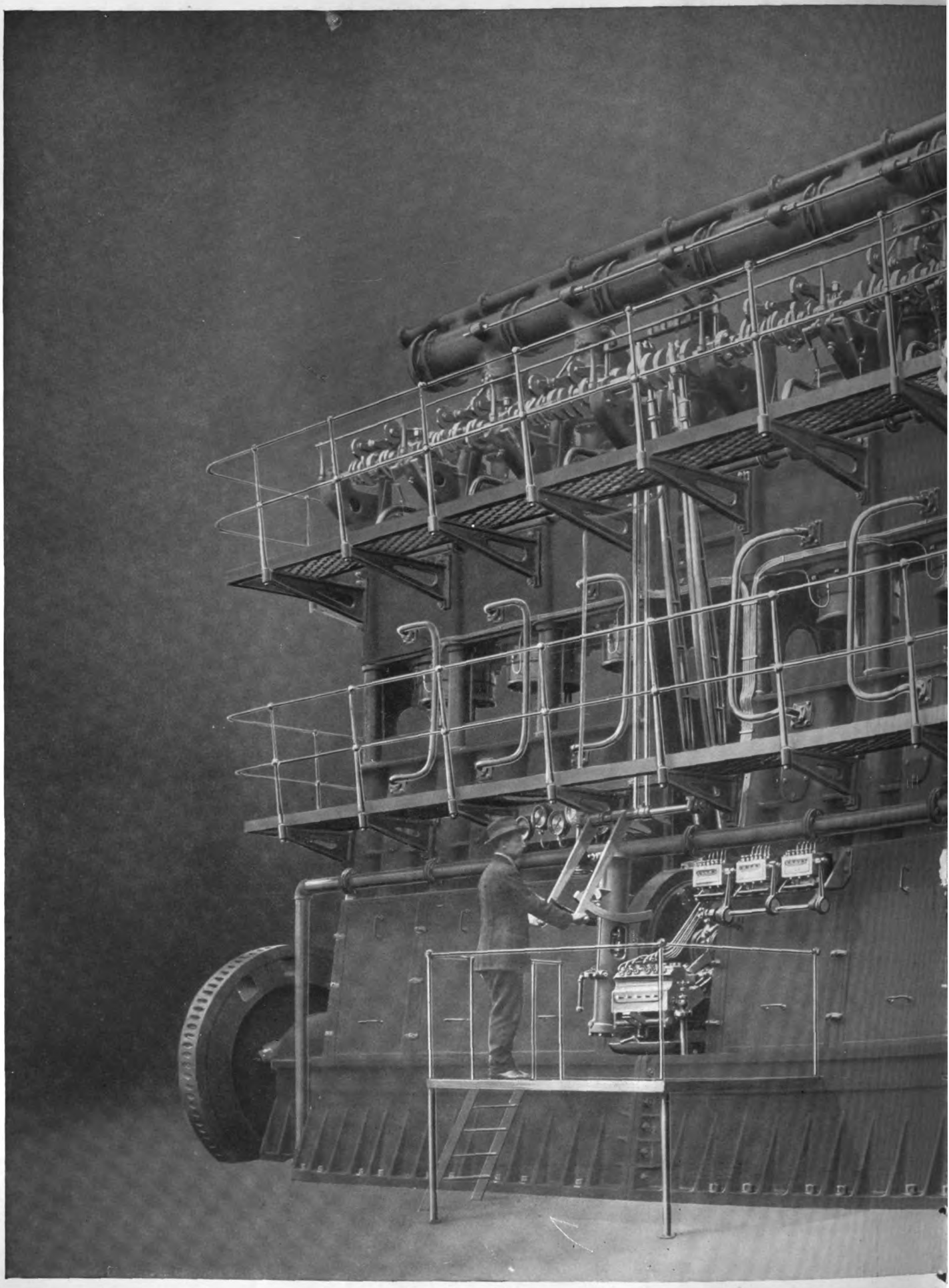

ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INSTALL

PACIFIC DIESEL E

OAKLAND, C

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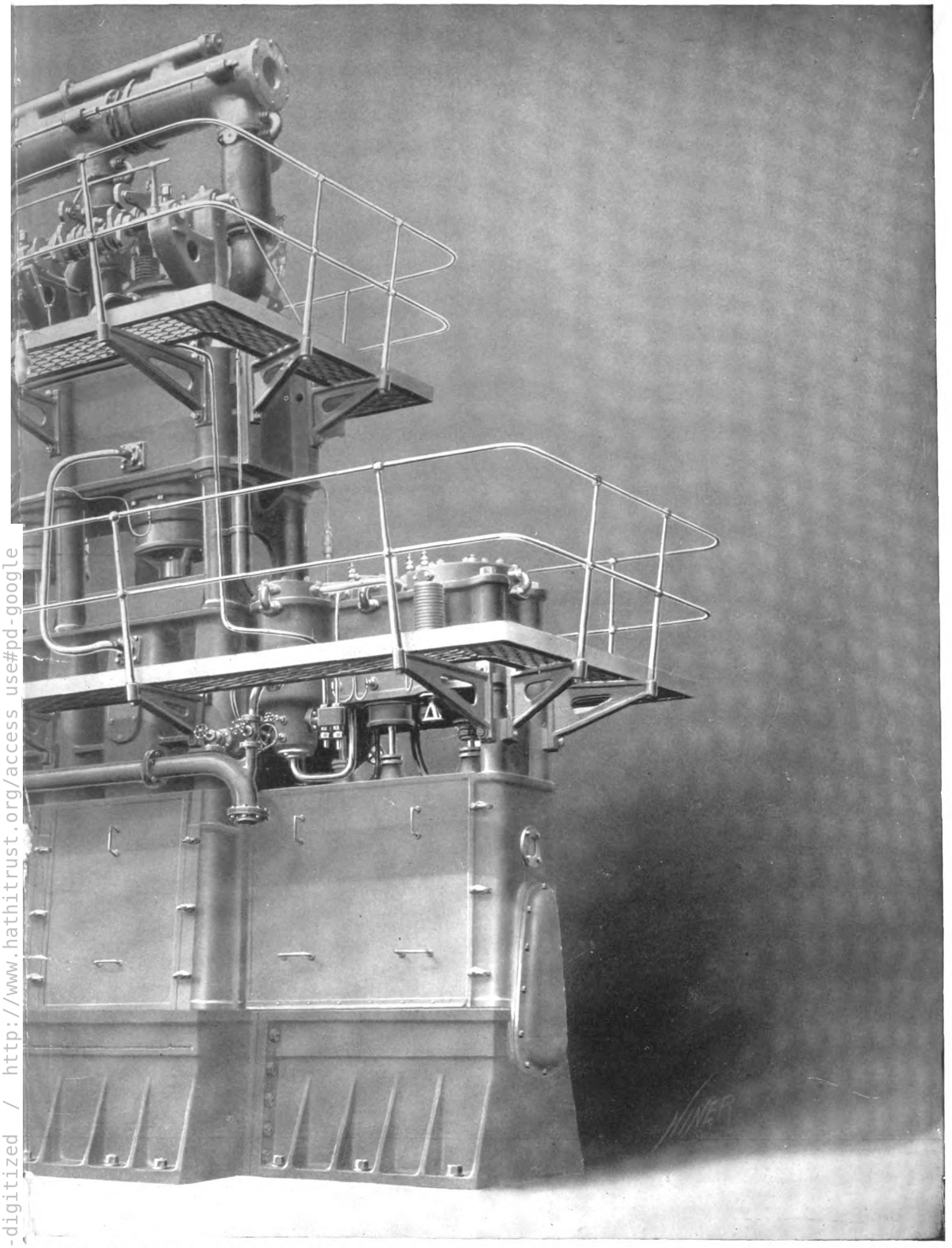
DIESEL ENGINES



LED IN THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

ENGINE COMPANY

CALIFORNIA

RELIABILITY

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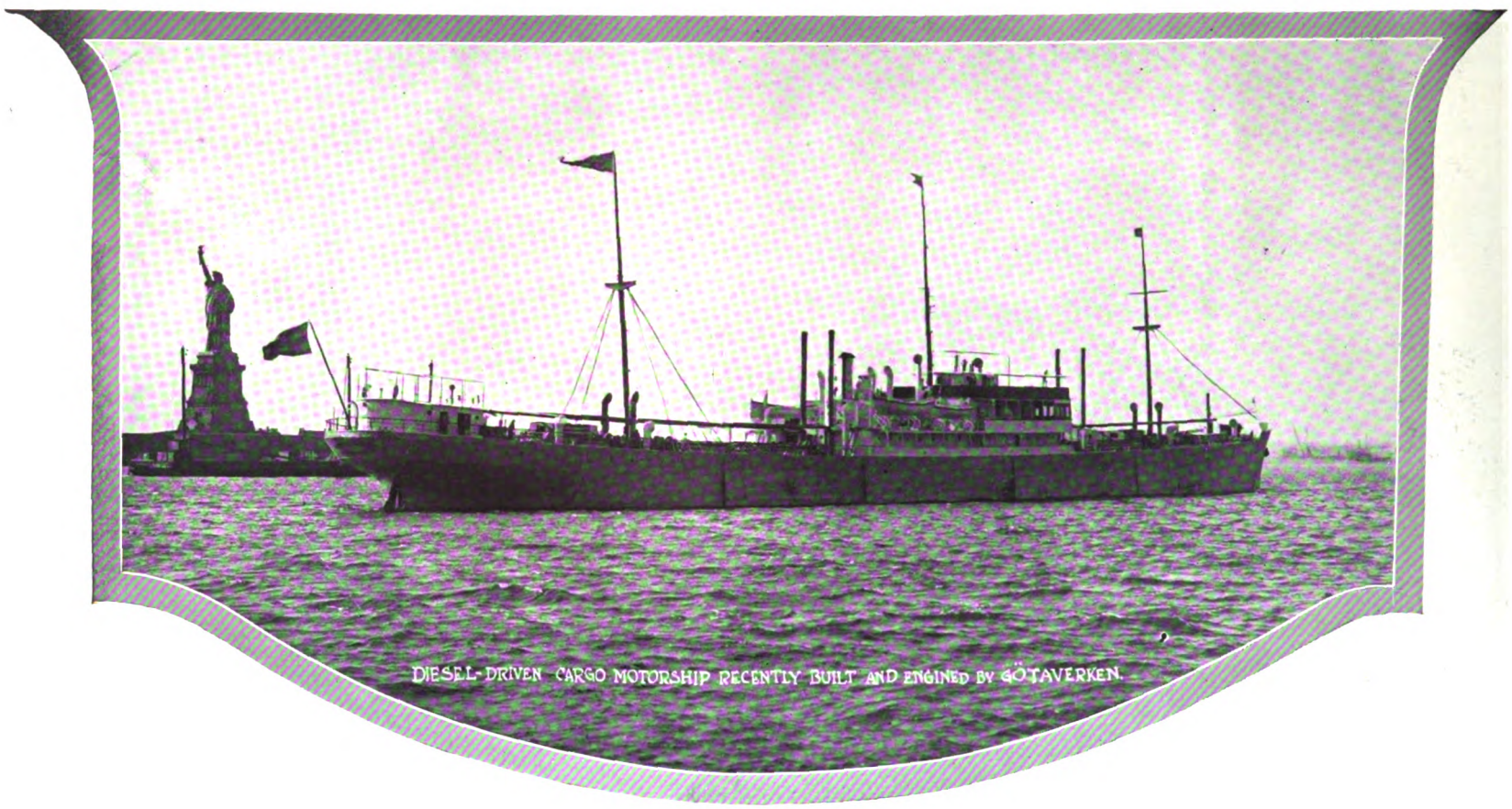
GÖTAVERKEN

GÖTEBORG—SWEDEN



DIESEL-DRIVEN CARGO MOTORSHIP RECENTLY BUILT AND ENGINED BY GÖTAVERKEN.

SHIPBUILDERS, ENGINEERS AND SPECIALISTS IN THE REPAIR OF MOTORSHIPS, STEAMSHIPS AND THEIR RESPECTIVE MACHINERY

TWELVE GÖTAVERKEN-BUILT MOTORSHIPS IN SERVICE, AGGREGATING 99,450 TONS D.W. AND 37,400 I.H.P., ALSO ONE DIESEL-DRIVEN SALVAGE-VESSEL OF 1,250 I.H.P. IF YOUR MOTORSHIPS NEED REPAIR IN EUROPEAN WATERS, SEND THEM TO OUR YARD IN PREFERENCE TO A PLANT THAT HAS HAD LITTLE OR NO EXPERIENCE WITH THE CONSTRUCTION OF HIGH-POWERED DIESEL-ENGINED MOTORSHIPS. WE HAVE BUILT SUCCESSFUL STEEL MOTORSHIPS OF LARGE SIZE UP TO 14 KNOTS SPEED. OUR LARGE FOUNDRY CAN SUPPLY DIESEL-ENGINE CASTINGS TO ORDER.

CONSTRUCTIONAL LICENSEES IN SWEDEN OF THE BURMEISTER & WAIN DIESEL MARINE OIL-ENGINE

DIESEL ENGINE WORKS

SHIPYARD—FOUNDRY

FLOATING DRY-DOCK WITH A LIFTING CAPACITY OF 12,000 TONS

POSTAL AND TELEGRAPHIC ADDRESS

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THE NEW IMPROVED FRISCO STANDARD HEAVY OIL ENGINE

THE OLD RELIABILITY —— THE NEW ECONOMY

THE name "FRISCO STANDARD" has always stood for unassailable leadership and dominating quality among heavy duty marine motors.

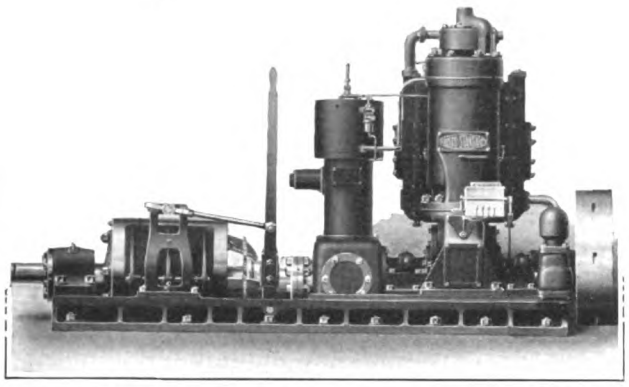
No other gasoline or distillate motor is so widely used throughout the world, nor has any acquired such a reputation for continuous dependability and endurance throughout almost never-ending years of service.

Our new product, the Frisco Standard Heavy Oil Engine, is designed and built to worthily uphold and carry on the traditional reputation of the old.

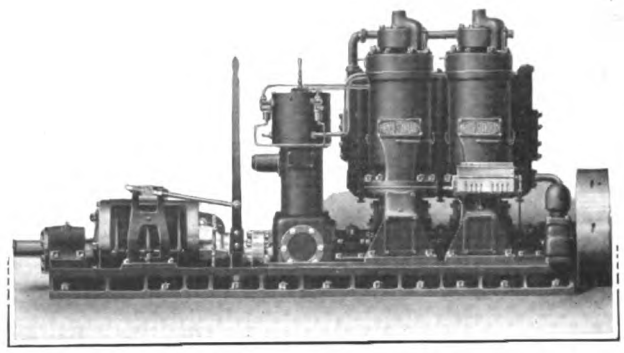
7½ to 300 B. H. P.

THE Frisco Standard Heavy Oil Engine is not an experiment. Built under license from America's most successful Surface-Ignition engine manufacturer whose product, extending over a period of fifteen years, has been a complete success, the new motor has been improved and perfected by our engineers who have added the benefits of their twenty or more years of specialized experience in the marine motor field. The result is a finer, sturdier engine that is a step ahead of the very best in modern oil engine practice.

NO AIR INJECTION

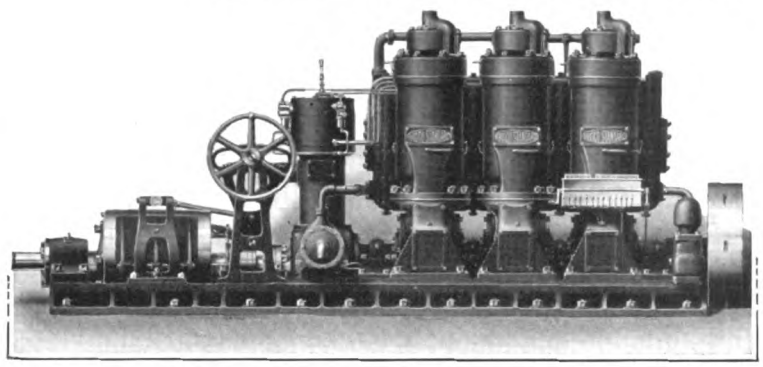


Single Cylinder Type, Built in Sizes 7½, 12½, 17½, 37½ and 50 h. p.

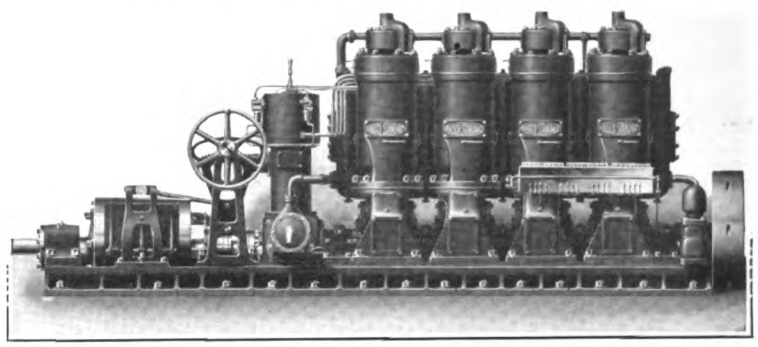


NO WATER INJECTION

Double Cylinder Type, Built in Sizes 15, 25, 35, 50, 75 and 100 h. p.



Three-Cylinder Type, Buit in Sizes 25, 40, 55, 75, 110 and 150 h. p.



Four-Cylinder Type, Built in Sizes 35, 55, 75, 100, 150 and 200 h. p.

Unexcelled in Workmanship and Design

TYPE: Semi-Diesel, 2-cycle, very few working parts, simple in construction, easy of operation by the unskilled, low in first cost and low in maintenance.

COMPRESSION: Low compression allows engine to operate under the least possible strain.

FUEL: Will burn any available Diesel Fuel Oil that is free flowing.

FUEL INJECTION: Of the solid or airless injection type, eliminating high pressures. Fuel introduced into combustion chamber thoroughly broken up and vaporized spreads into every part of combustion space. This results in instant and universal ignition with complete combustion. Fuel nozzle has no small holes to carbonize and require frequent drilling out, and will operate indefinitely.

BUILT TO LLOYDS: Conforms in every way to Lloyds, Bureau Veritas and the American Bureau of Shipping's requirements for marine engines.

GOVERNOR: Absolutely a perfect governing device. In a class by itself. Not only permits of a wide range of controlled speed, but changes direction of rotation, at will of operator.

Send for Heavy Oil Engine catalog just off the press and name of nearest Frisco Standard Dealer

Many New and Exclusive Features

STARTS QUICKLY: Fitted with electric quick starting device.

AIR STARTING VALVES: Mechanically operated and properly timed to prevent any possibility of dangerous pressures being built up through neglect or inexperience of operator.

ROTARY AIR VALVES: Mechanically operated and timed to assure the correct supply of air and positive scavenging, so essential to successful operation. A decided improvement over the automatic flap valve, customarily used.

ROLLER BEARING PISTON PIN: Eliminates all trouble at this point. Our type of roller bearing in three years constant usage has not shown a diametral wear of .002 inch.

CRANK CASE AIR SEAL RINGS: Assure at all times proper crank case compression, by maintaining crank case absolutely air tight. Also prevents any leakage of oil from the bearings.

REVERSE GEARS: All engines up to and including 150 H.P., regardless of number of cylinders, fitted with reverse gears.

DIRECT REVERSING: 3, 4 and 6-cylinder engines are Directly Reversible and handle with the ease and reliability of a steam engine.

The new improved Frisco Standard heavy oil engine is built in sizes from 7½ to 300 h.p., one to six cylinders, for both marine and stationary purposes. In every respect, the features that have characterized the Frisco Standard distillate engine for years and made it the world's leader among work boat engines, have been carried out in the design and construction of the heavy oil engine.

Frisco Standard dimensions are everywhere much larger than is ordinarily considered necessary in oil engine practice; horse power ratings are exceedingly conservative; accessibility of parts has been made one of the prime considerations and the unit system of construction, combined with the machining of all parts to jigs and gauges, assures absolute interchangeability and minimizes cost of material with little time lost in effecting replacements.

Dennison & King Streets **STANDARD GAS ENGINE CO.** Oakland, Cal., U. S. A.

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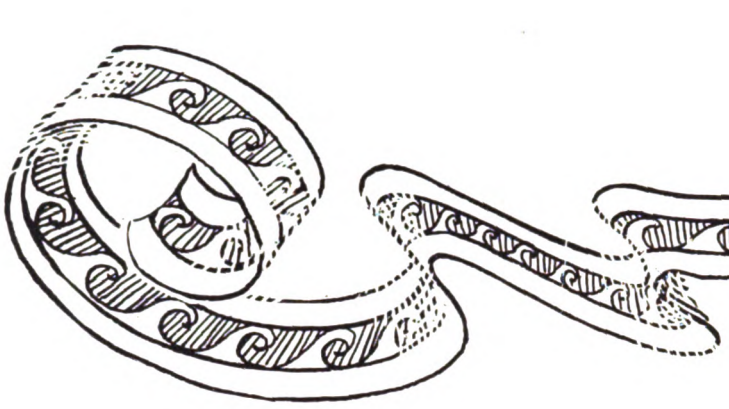


Wi

OIL DIESEL TYPE

COLLEEN

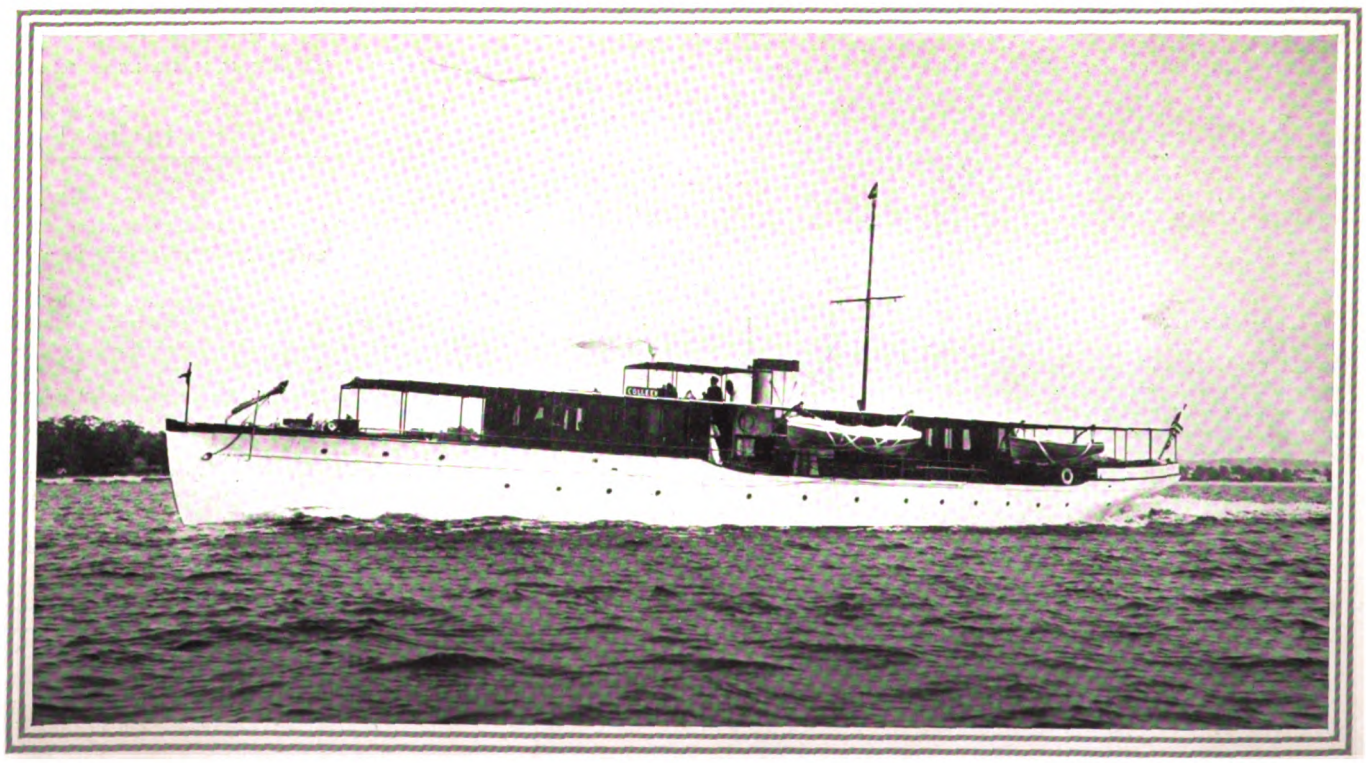
Length:- 110 ft. Beam:- 18ft. 2in. Draft:- 6 ft.

Owner:- Samuel A. Salvage, Port Washington, L. I.

Designer:- B. T. Dobson, New Bedford, Mass.

Builders:- George Lawley & Son Corp., Neponset, Mass.

Power Plant:- A pair of six cylinder Winton Diesel Oil Engines rated at 135 H. P. each, designed and built by the Winton Engine Works, Cleveland, Ohio



WINTON ENGINE WORKS,

New York City—A. G. Griese, Inc., 30 Church St. *Seattle*—H. W. Starrett, Sunset Engine Co.
Washington, D. C.—R. L. Fryer, 817 Alboe Bldg.

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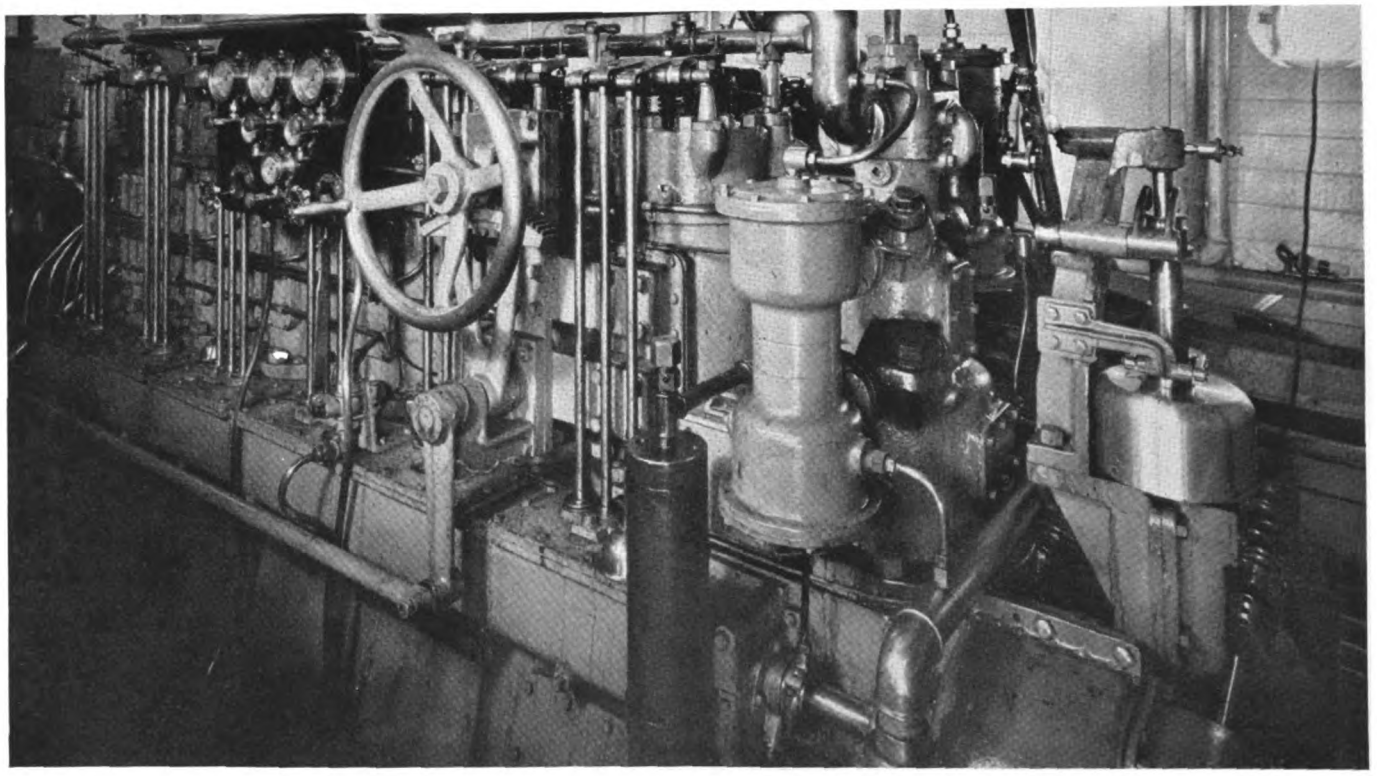
ton ENGINES

The Power and efficiency of the Winton Diesel Type Oil Engine is recognized by marine engineers and discriminating owners the world over. Ask your Engineer!



CLEVELAND, OHIO, U. S. A.

Los Angeles, Cal.—F. G. Bryant, 704 Delta Bldg.
New Orleans, La.—A. Baldwin & Company

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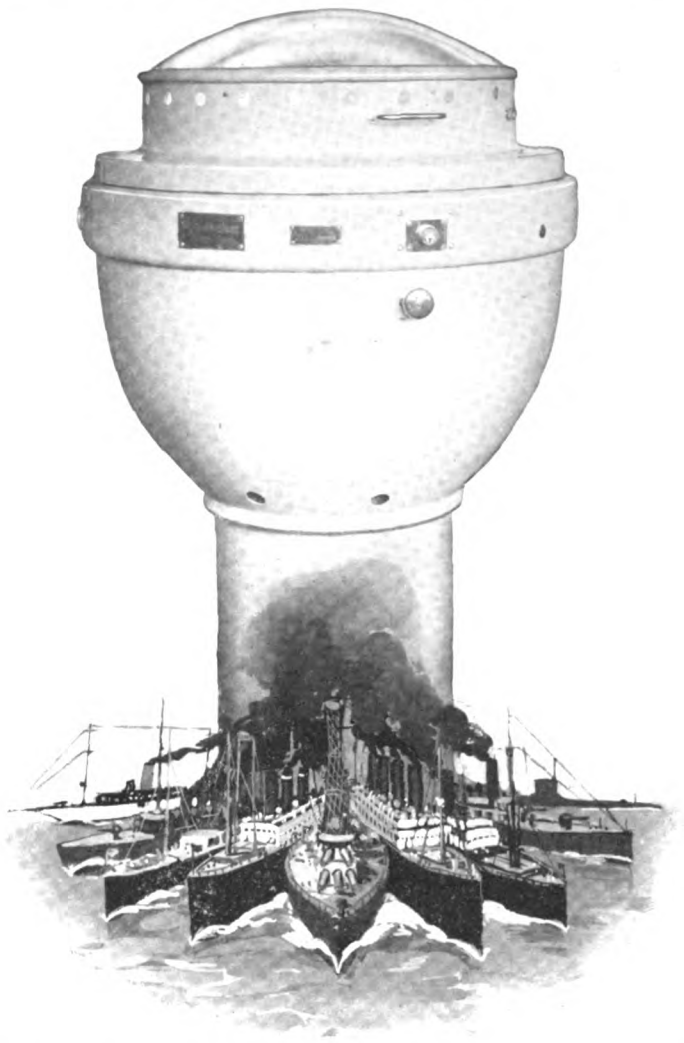
BEHIND THEM ALL, STANDS— THE SPERRY GYRO-COMPASS



EVERY branch of the marine service now steers by the Sperry Gyro-Compass.

SUBMARINES, battleships, cruisers, destroyers, oil tankers, revenue cutters, lumber carriers, cargo vessels, yachts, diesel ships, passenger vessels, Great Lake steamers, up to the latest diesel ships CALIFORNIAN and MISSOURIAN, the Sperry serves them all.

IN addition to the navies of the world, where the Sperry has been the standard compass for over a decade—26 of the largest ship operating concerns of the world cover these classifications.

OVER ten years of actual service experience, coupled with unceasing research and development work, the Sperry Gyro-Compass today is an important contribution to 20th century navigation.

THE new improved Sperry Gyro-Compass will be on exhibition at our booth during the Marine Show, November 4th to 11th.

THE SPERRY GYROSCOPE CO.
MANHATTAN BRIDGE PLAZA
BROOKLYN, N.Y.

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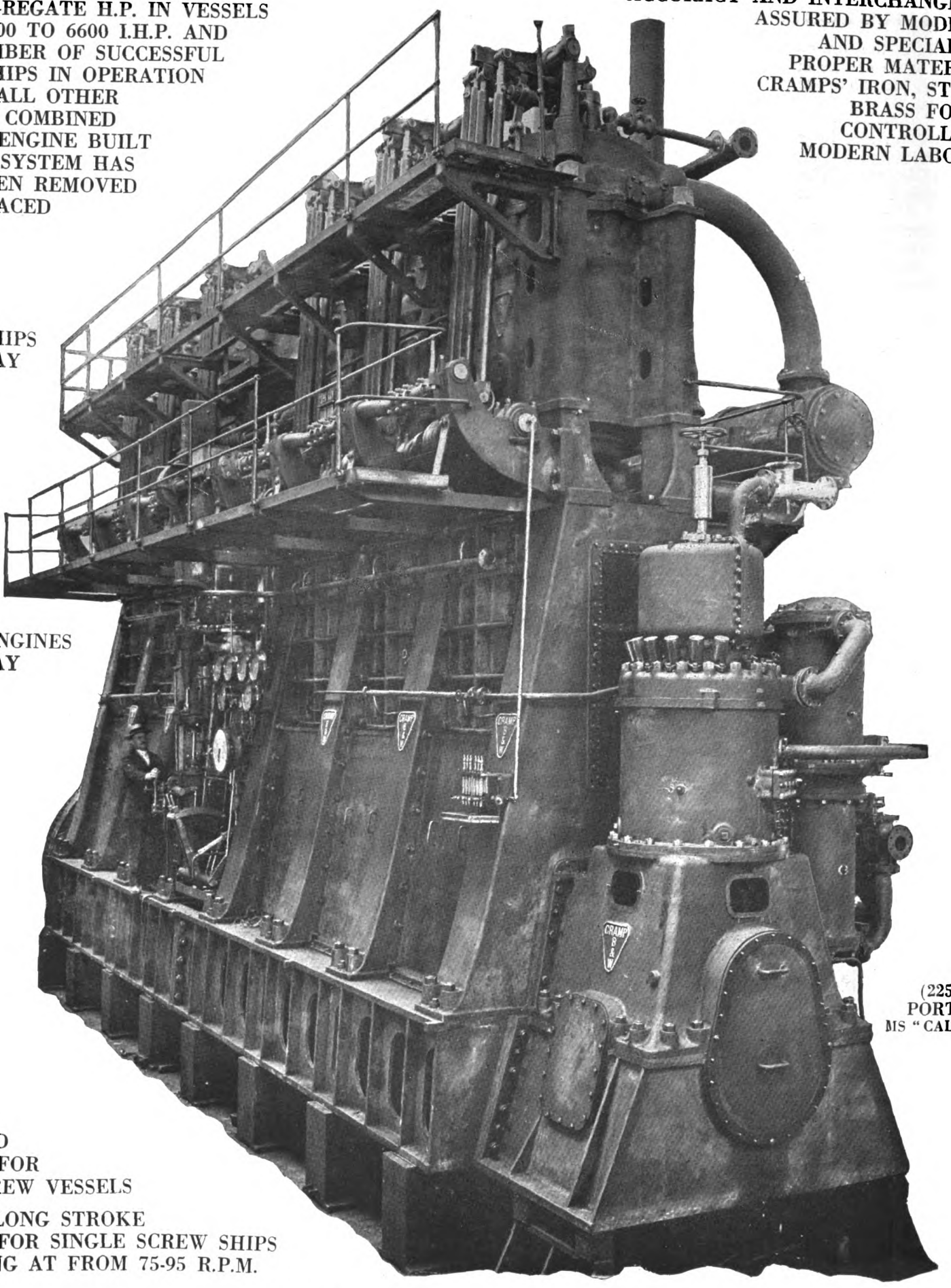
UNDER THE B. & W. SYSTEM THE AGGREGATE H.P. IN VESSELS FROM 1500 TO 6600 I.H.P. AND THE NUMBER OF SUCCESSFUL MOTORSHIPS IN OPERATION EXCEED ALL OTHER SYSTEMS COMBINED AND NO ENGINE BUILT TO THIS SYSTEM HAS EVER BEEN REMOVED OR REPLACED

ACCURACY AND INTERCHANGEABILITY ASSURED BY MODERN JIGS AND SPECIAL TOOLS; PROPER MATERIALS BY CRAMPS' IRON, STEEL AND BRASS FOUNDRIES CONTROLLED BY A MODERN LABORATORY

MOTORSHIPS THAT STAY ON THE SEAS

DIESEL ENGINES THAT STAY IN THE SHIPS



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PORT ENGINE
MS "CALIFORNIAN"

STANDARD ENGINES FOR TWIN SCREW VESSELS

SPECIAL LONG STROKE ENGINES FOR SINGLE SCREW SHIPS OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE

(Burmeister & Wain System)

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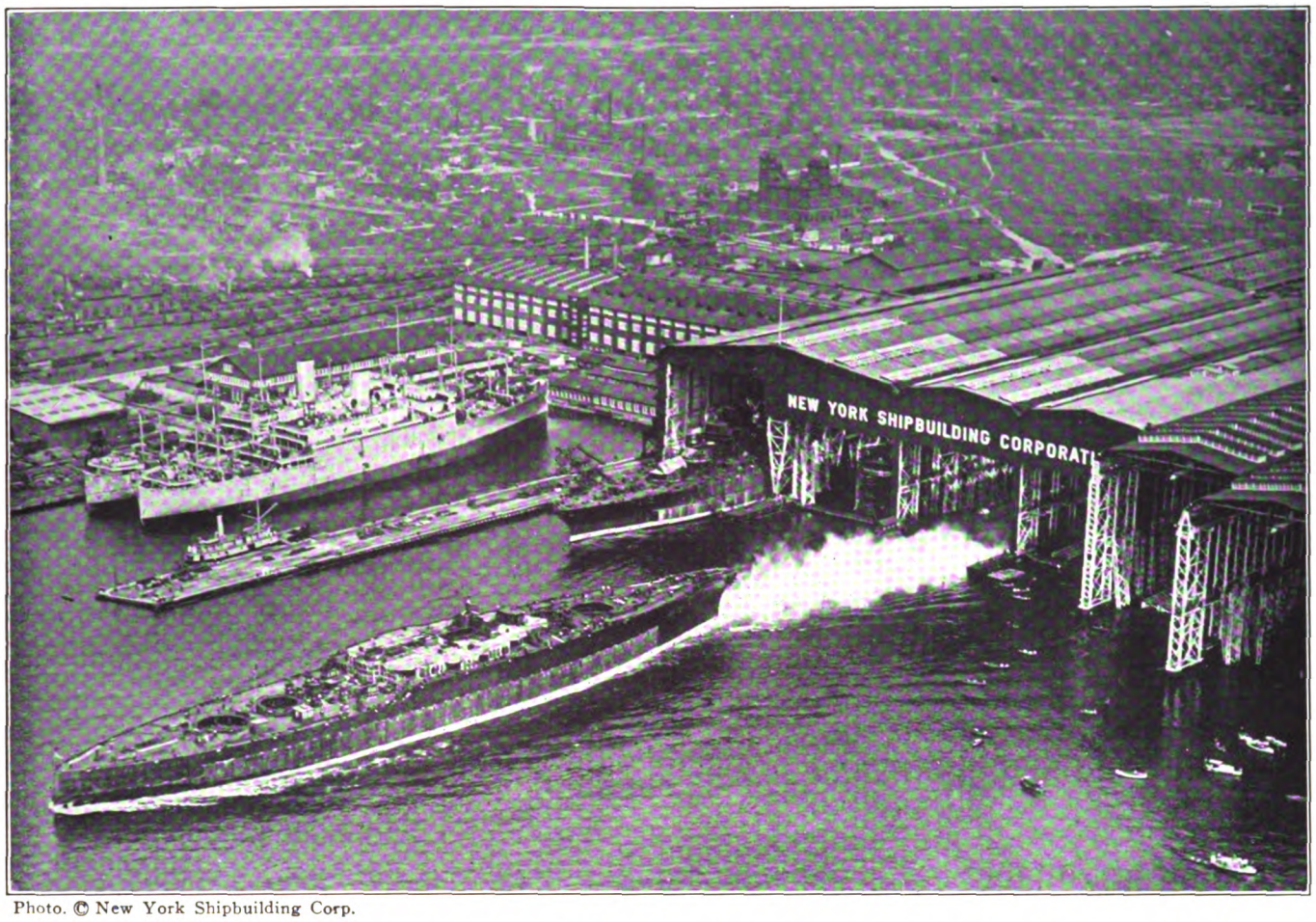

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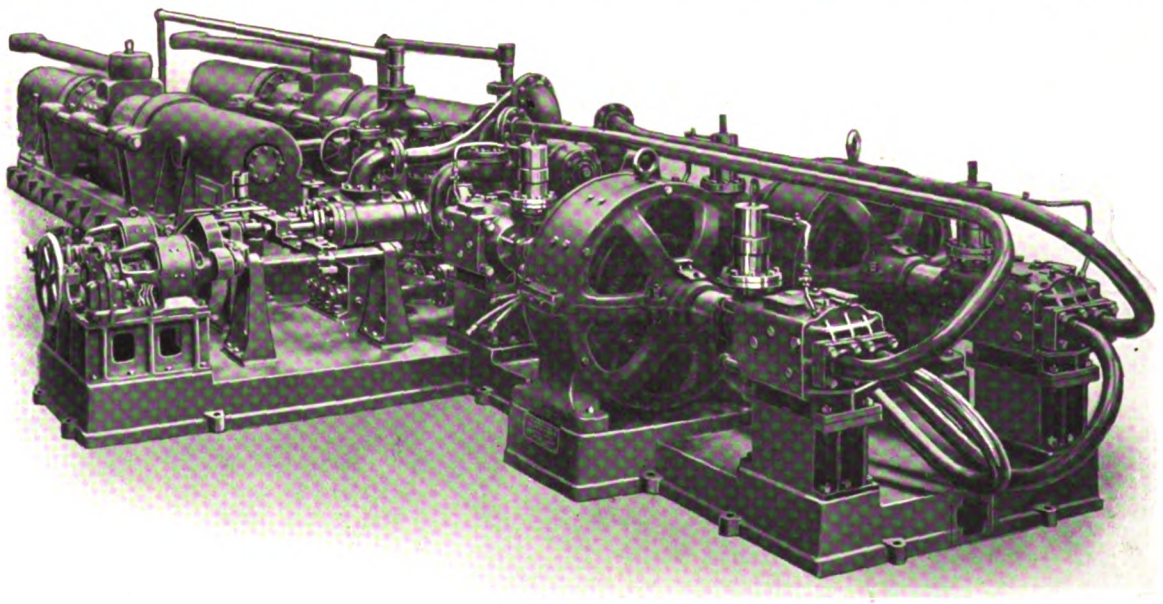
NEW YORK SHIPBUILDING CORPORATION

MAIN OFFICE AND WORKS

CAMDEN, NEW JERSEY, U. S. A.

HYDE WINDLASS COMPANY - Bath, Maine

High grade marine auxiliary machinery and manganese bronze propellers



"Hydro-Electric Steering gear installed on U. S. Battleship COLORADO"

Hydro-electric Steering-gears, electric-windlasses, electric-winches, electric-capstans for motorships a specialty

When ordering specify "HYDE"

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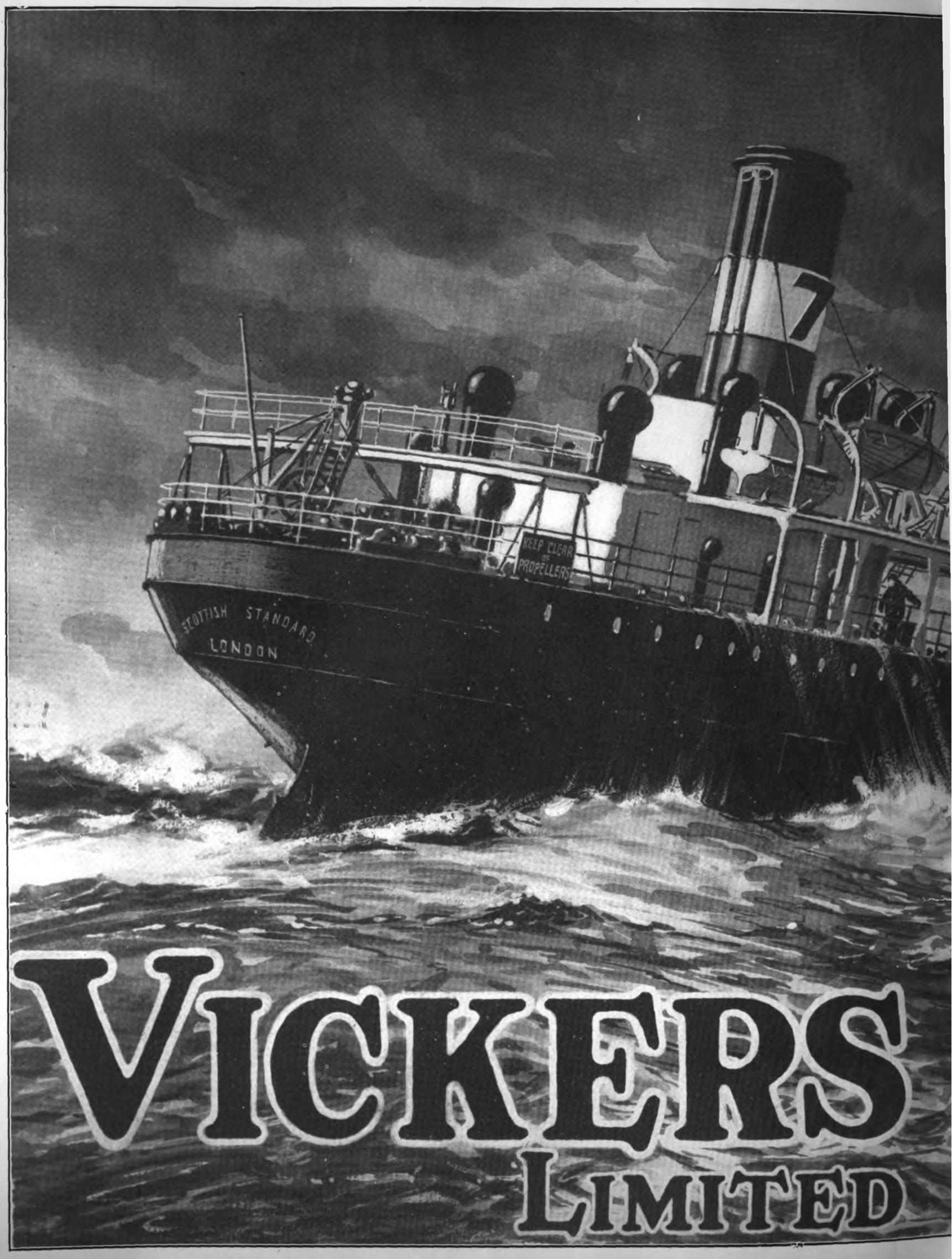

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MARINE OIL ENGINES

Specially designed for Mercantile-Marine use. Rugged, Rigid, Simple and Accessible. No Injection Air Compressor. Rating conservative and quoted in Brake Horse-Power. Guaranteed for continuous running. The design embodies the experience of Marine Oil-Engines totalling half-a-million horse-power.

Works: Barrow-in-Furness, England
Head Office: Vickers House, Broadway, London, S. W. I.
New York Office: 2550 Woolworth Building, 233 Broadway

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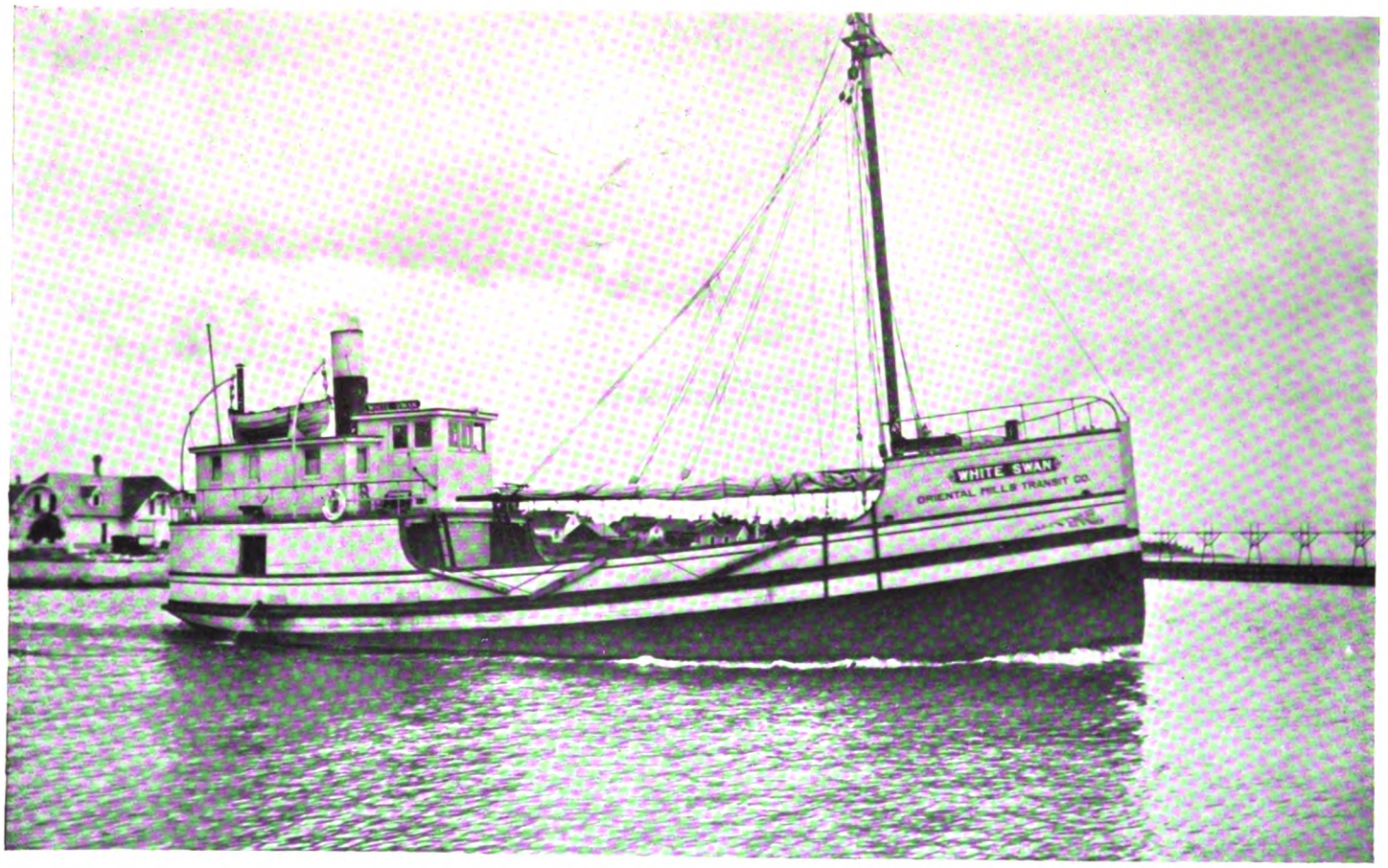
Kahlenberg

Heavy Oil Engines



85' Barge Equipped With a 100-120 H. P. Kahlenberg Oil Engine

The White Swan is 85′ x 23′ x 8′, planked with 3″ white oak, designed and built by the Burger Boat Co., for the Oriental Mills Transit Co. Power plant consists of a 100-120 H.P. 4 cylinder Kahlenberg reversing oil engine, which gives her a speed of 10 miles light and 9 miles loaded. The owners report that after a full season of operation she has proven an exceptional freighter from point of design, power equipment, and the low cost of operation.

It is readily noted that this boat with raised forecastle, long cargo hold amidships, and engine room aft, makes one of the most efficient types of freighters for coastwise trade.

Note These Original Features :

Patented—Governor Control
Patented—Injection Control
Patented—Air Starting and Reversing
Patented—Water Cooled Combustion Chamber
Patented—Pressure Fuel Oil Strainer

Every part "getatable" and removable.

Guaranteed to operate perfectly on any of the crude fuel oils or kerosene

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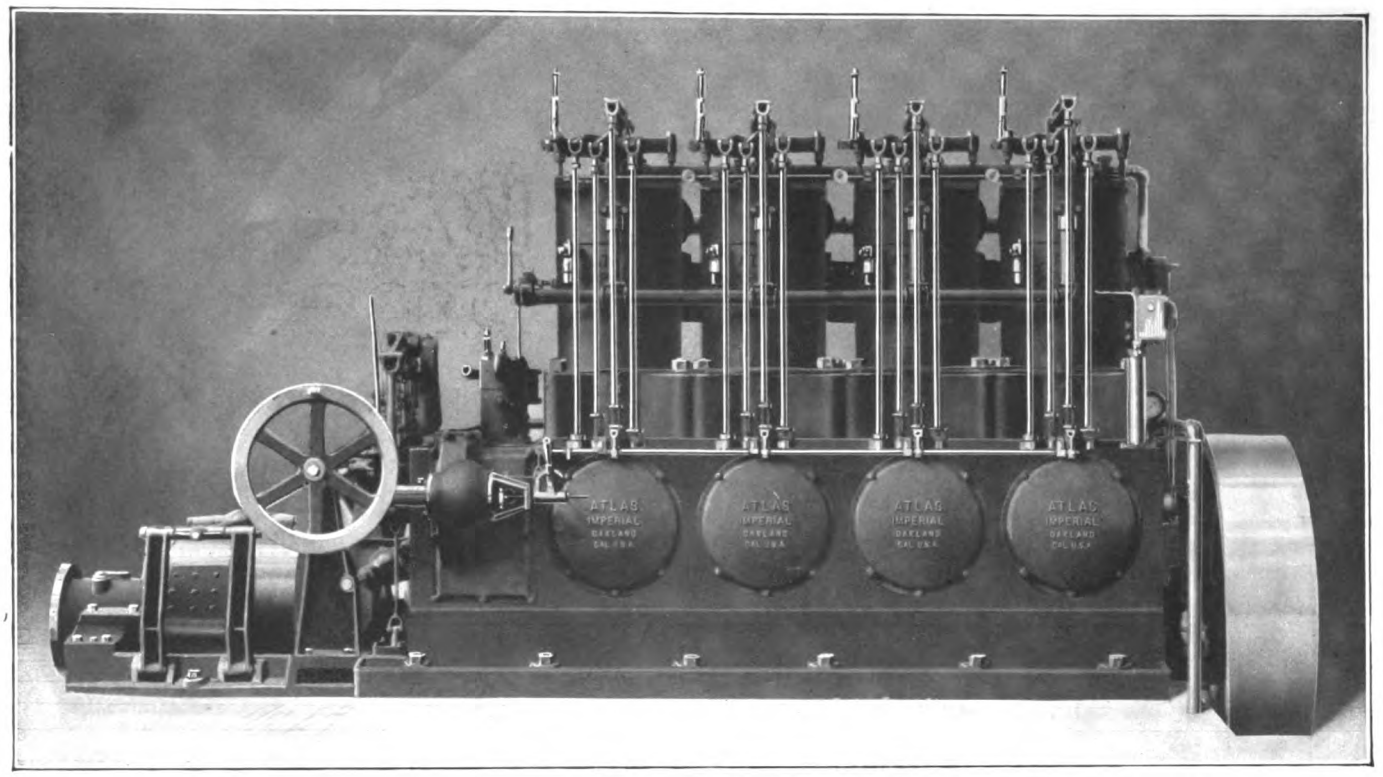

165 H. P. MECHANICAL-INJECTION MARINE DIESEL-ENGINE
BUILT IN 3, 4 and 6 CYLINDER TYPES 55 TO 500 HORSE-POWER

SOME CHARACTERISTICS OF OUR ENGINES:

STARTING:	Is accomplished by compressed-air at 30 to 150 lbs. pressure in 5 to 10 seconds from stone cold to full power.
FUEL INJECTION:	Fuel-oil is injected into the combustion-chamber by mechanical means, no high-pressure air is used.
FUEL IGNITION:	Ignition is accomplished by the heat of compression only, no hot-balls, points, or surfaces of any kind are used.
COMPRESSION:	350 lbs. per square-inch.
FUEL CONSUMPTION:	One gallon of crude-oil for 19 horsepower per hour.
GRADE OF FUEL:	Any grade of fuel-oil is used that will flow readily through the pipes to the engine.
COST OF FUEL:	About 1/10 of a gas-engine.
LUBRICATION:	Return force-feed system to bearings through hollow crank-shaft and connecting-rod. Mechanical feed to cylinders. Consumption 1/10 gallon per 100 H. P. hour.
POWER:	Engines develop 20% in excess of rated power.
GOVERNING:	Gear-driven fly-ball governors regulate the quantity of fuel used, and sensitively controls the speed of the engine from no-load to full-load and vice versa with a variation in speed of not over 5%.
VIBRATION:	Less than a heavy-duty gas-engine.
RELIABILITY:	Absolutely dependable under the most trying conditions.
FLOOR SPACE:	About 15% greater than a heavy-duty gas-engine of same power.
WEIGHT:	Slightly greater than heavy-duty gas-engines of same power.
ACCESSIBILITY:	All parts are easy of access and made interchangeable as far as practical.
MATERIAL & WORKMANSHIP:	Are the highest possible standard for commercial purposes. All parts made from carefully selected material with a view of its special service, carefully machined to jigs and templates and ground and hardened where necessary.
SPEED:	Revolutions can be varied from 80 to 350 per minute.
SALES:	Our sales are rapidly increasing and every engine is giving wonderful service and satisfaction.

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Our Diesel engine in your boat will please you and make you money.

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JUNEAU, ALASKA—Charles G. Warner Company
NEW ORLEANS, LA.—J. G. Davis, 1324 Music St.
NOME, ALASKA—Alaska Lighterage and Commercial Co.
PAPETTE, TAHITI—Et Davio
SAN PEDRO, CAL.—Garbutt & Walch
SEATTLE, WASH.—Atlas Gas Engine Agency, 901 Western Ave.
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ATLAS IMPERIAL ENGINE COMPANY
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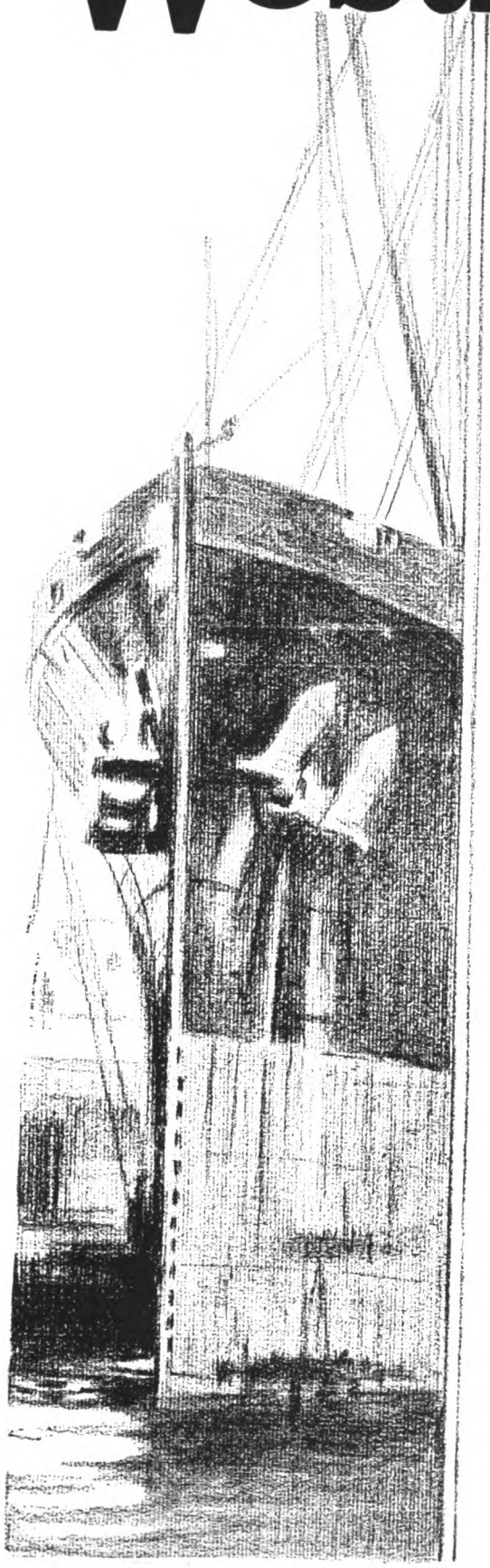

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At the Grand Central Palace, New York City, November 4 to 11, you will find many interesting and new Westinghouse developments, among which are:—

Exhibit showing Westinghouse Diesel-Electric System of Propulsion.

—100 kw. Westinghouse Turbine-Generator set

—25 hp. Westinghouse Marine type Deck Winch Motor and Control.

—Marine Reduction Gearing

—Marine Air Ejector

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—Electric Lighting Set for small craft.

A visit to the Westinghouse booth will be both interesting and instructive.

Everybody welcome.

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East Pittsburgh, Pa.

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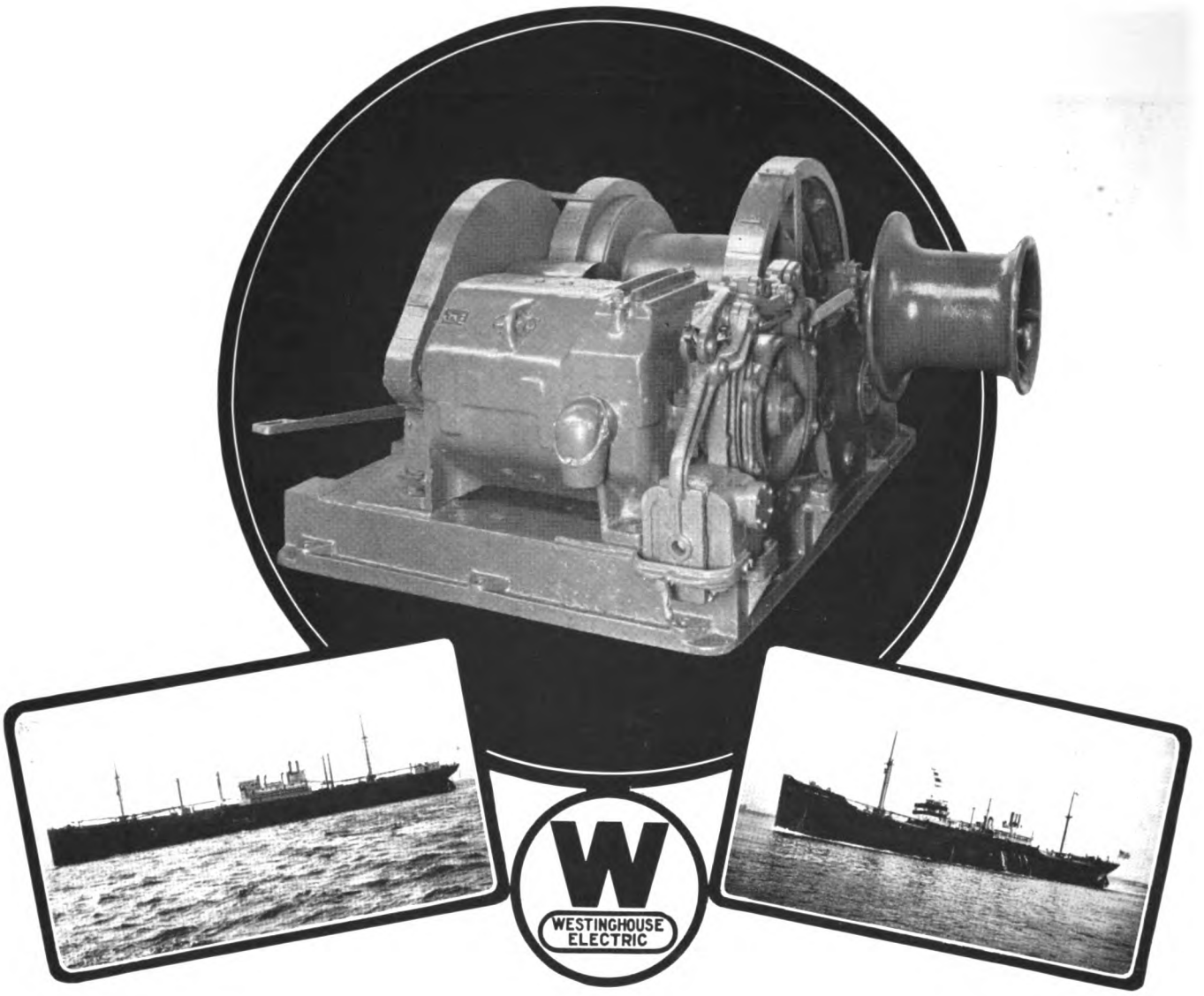

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The efficient operation of the electric deck auxiliaries of the motorships William Penn and Californian was responsible for the remarkably short time required in port for discharging and loading cargo. Quick turn-arounds spell success and profit for a ship.

Both the M.S. William Penn and the M.S. Californian are test ships, especially fitted to thoroughly try out motor driven deck auxiliaries. The M.S. William Penn has already circled the globe twice, covering more than 60,000 miles and has thoroughly tried out her deck auxiliaries under the most severe conditions of actual practice.

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Westinghouse deck winch motors are designed with speeds equalling the fastest steam winch. If necessary, even greater speeds can be obtained.

The electrification of deck auxiliaries is an important factor in the economic operation of merchant vessels.

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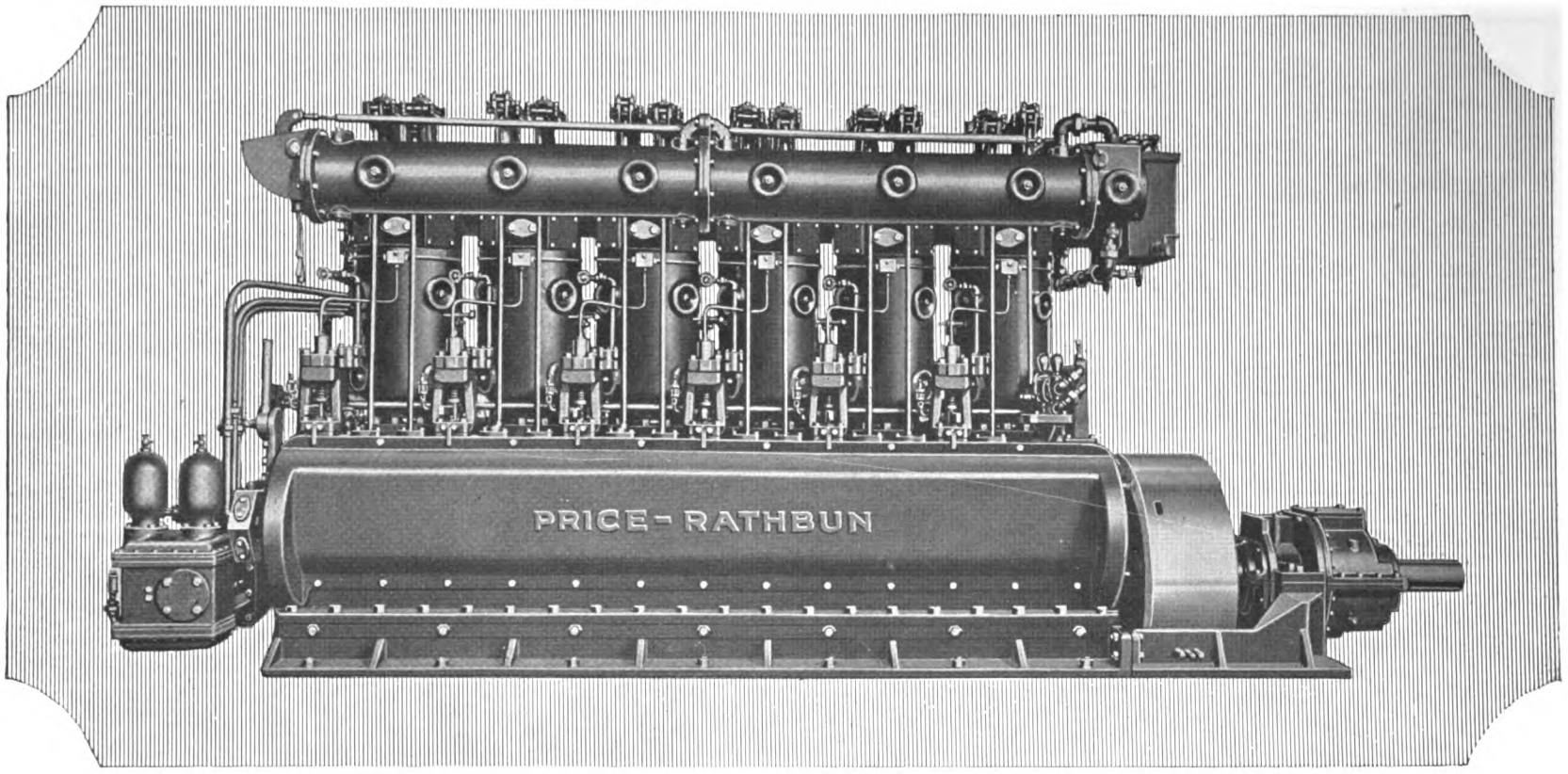

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for ship propulsion can be fully realized only when the electrical equipment is combined with oil engines possessing the *simplicity* and *high fuel economy* of the

PRICE-RATHBUN ENGINE

A line of sizes ranging from 240 to 750 BHP has been developed which gives the ship operator a wide choice in number and size of engine generator sets. These engines

Are designed for marine installation.

Have six cylinders.

Use the Price system of direct injection of fuel, eliminating the high pressure injection air compressor and thereby reducing the weight and floor space of installation.

Have automatic pressure system of lubrication.

Have a simple yet sensitive governor control which automatically proportions the fuel charge to meet load fluctuations, maintaining the constant speed essential for correct operation of electric generators and motors.

Have moderate weight per horse-power making it possible for total weight of installation to be no greater than for a direct drive installation.

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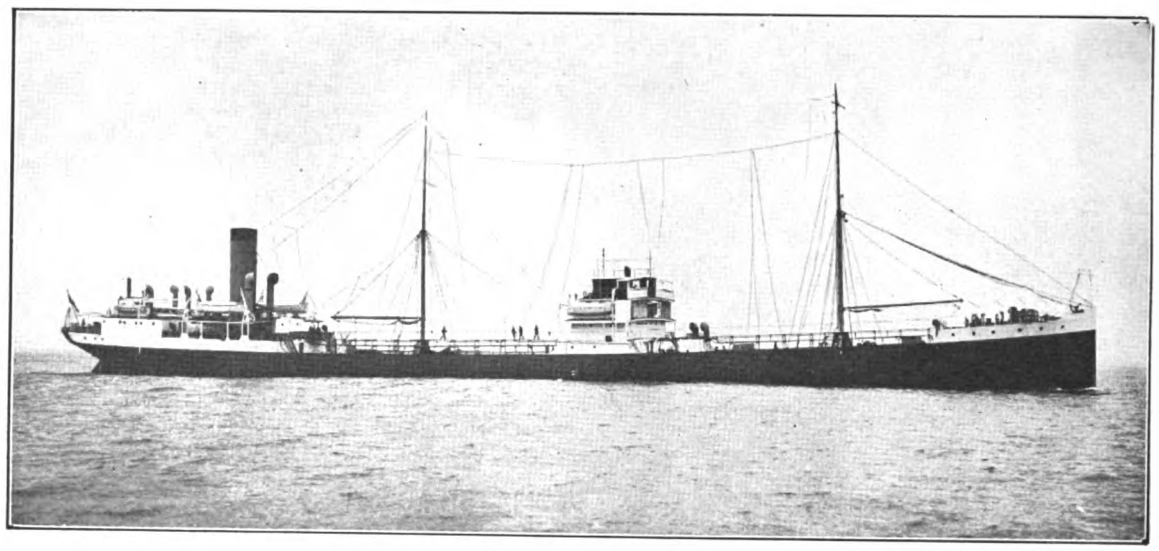

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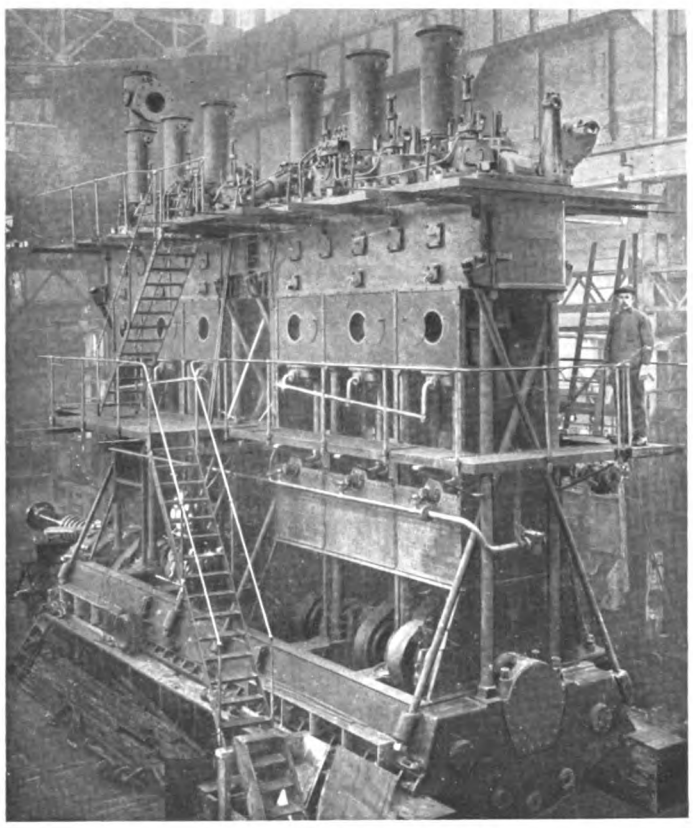
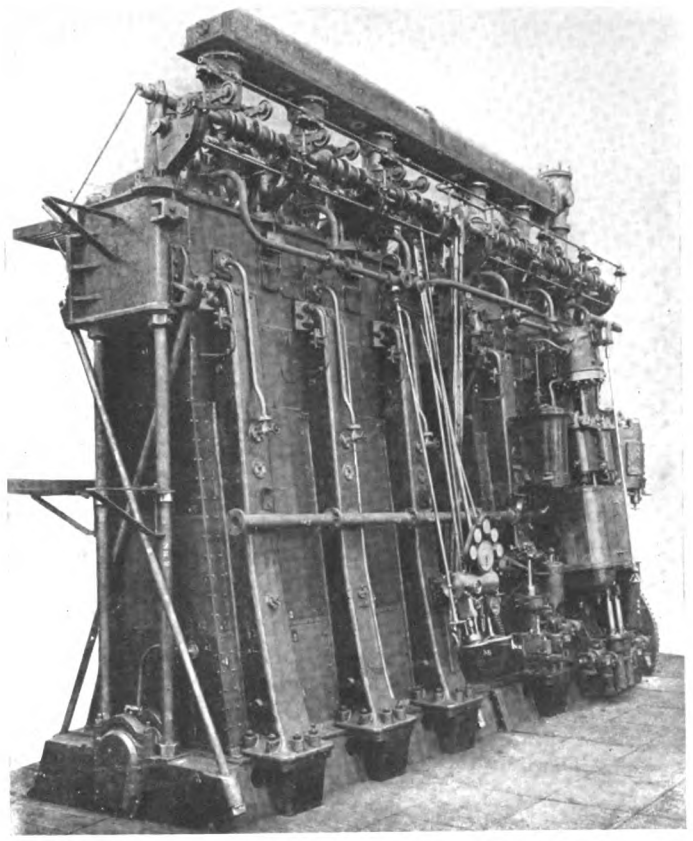
THE FIRST FULL-POWERED OCEAN-GOING MOTORSHIP WAS DRIVEN BY WERKSPOOR DIESEL OIL-ENGINES



1100 B. H. P. WERKSPOOR MARINE DIESEL ENGINE



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SIMPLICITY—ACCESSIBILITY—RELIABILITY

50 MOTORSHIPS IN SERVICE AND ON ORDER 50

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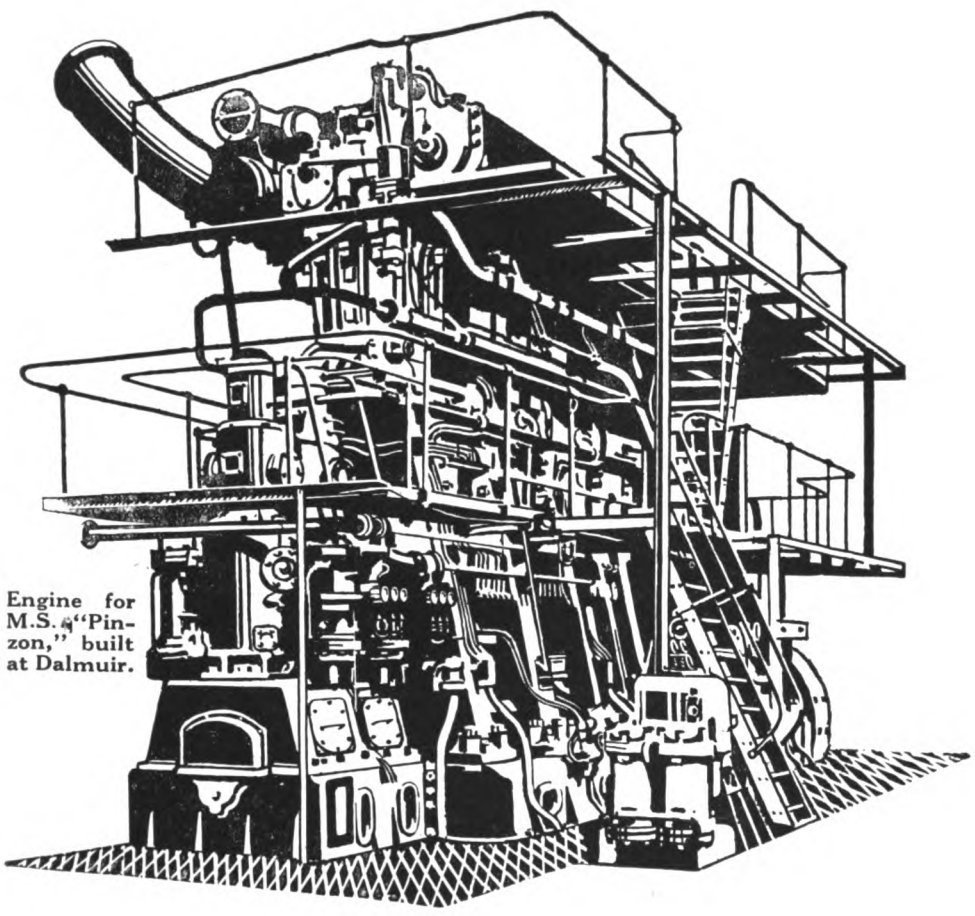
BEARDMORE TOST DIESEL *Marine Engine*

THE ENGINE THAT REPRESENTS THE GREATEST ADVANCE IN DESIGN AND IN MARINE PROPULSION



Engine for M.S. "Pinzon," built at Dalmuir.

Results of 100 Hours' Trial.

Average B.H.P.	1,276
Mechanical efficiency, per cent.	77
Average I.H.P.	1,646
Revolutions per minute	124
Mean pressure on B.H.P. basis, lb. per square inch	75.5
Fuel consumption, lb. per P.H.P. per hour	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. Fah.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average.	125
Piston cooling water, outlet temperature, deg. Fah., average	130
Blast air pressure, lb. per square inch	1,000

Extract from THE ENGINEER, November 11th, 1921.

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

Full particulars from the builders—

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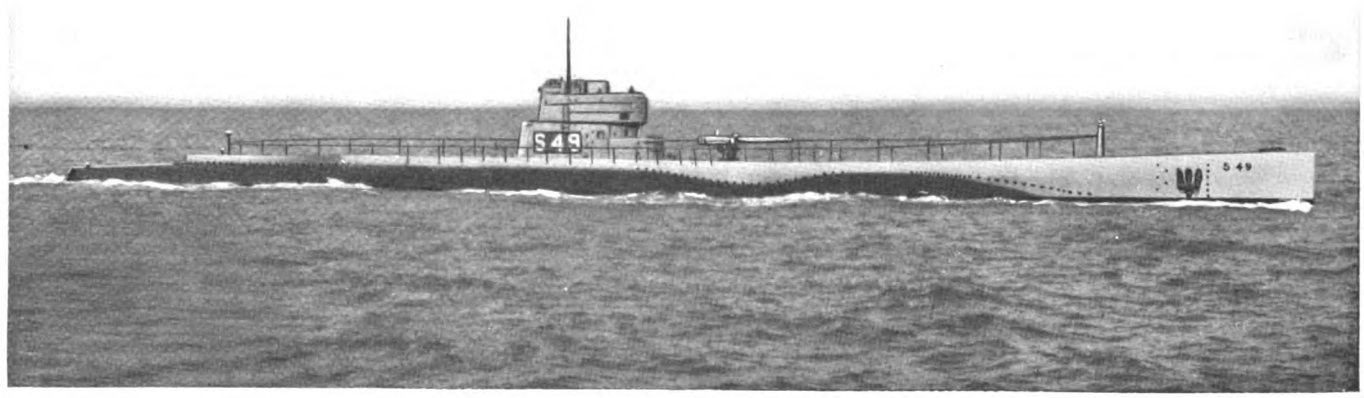

De Laval Purifier restores efficiency of oil after 1000 miles of service in submarine

A pint of sludge centrifuged out of ten quarts of oil taken from the Diesel lubricating system of a submarine after a 1000-mile cruise recently proved to the satisfaction of several engineers what the De Laval Oil Purifier can do with oil in its worst state. Before purification this oil was absolutely unfit for further use and would probably have been pumped overboard. After purification its lubricating qualities were equal to those of brand-new oil.

If the De Laval Purifier can do that on a batch of exceptionally dirty oil, how much must it add to the efficiency of lubrication when operated on the continuous by-pass system as generally recommended?

With this system, a stream of oil is continuously drawn from the bottom of the crank case (or in the case of a steam turbine, from the oil reservoir) and delivered to the De Laval Purifier. Here impurities are instantaneously centrifuged out and the purified oil is returned to the lubricating system.

Thus the oil is constantly kept free from impurities. Wear on bearings is materially reduced; sludge no longer accumulates in the oil grooves and channels of the engine; the necessity for disassembling the unit for manual cleaning is practically eliminated, and the oil need never be taken out of the system.

No engine can give the fullest measure of service unless it is properly lubricated. You'll agree that the most perfect lubrication can be obtained only by the constant use of clean oil. Let us tell you how the De Laval Purifier furnishes that kind of oil for *less* than your present lubricating costs.

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Please send Bulletins telling how the operation of ships' engines can be improved and lower lubricating costs obtained, with particular reference to the type of engine checked.

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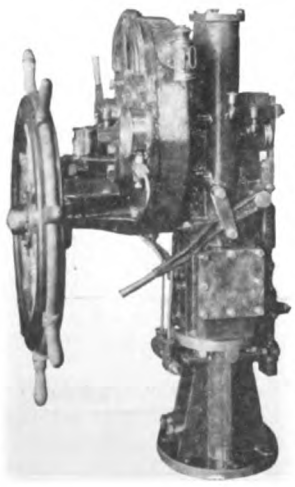

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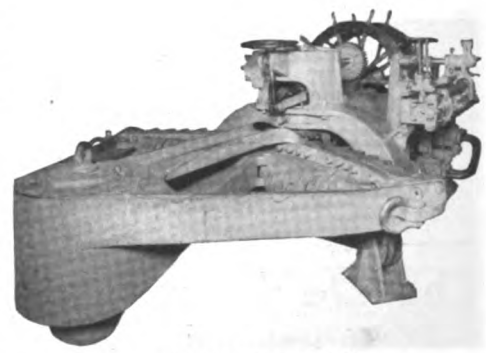

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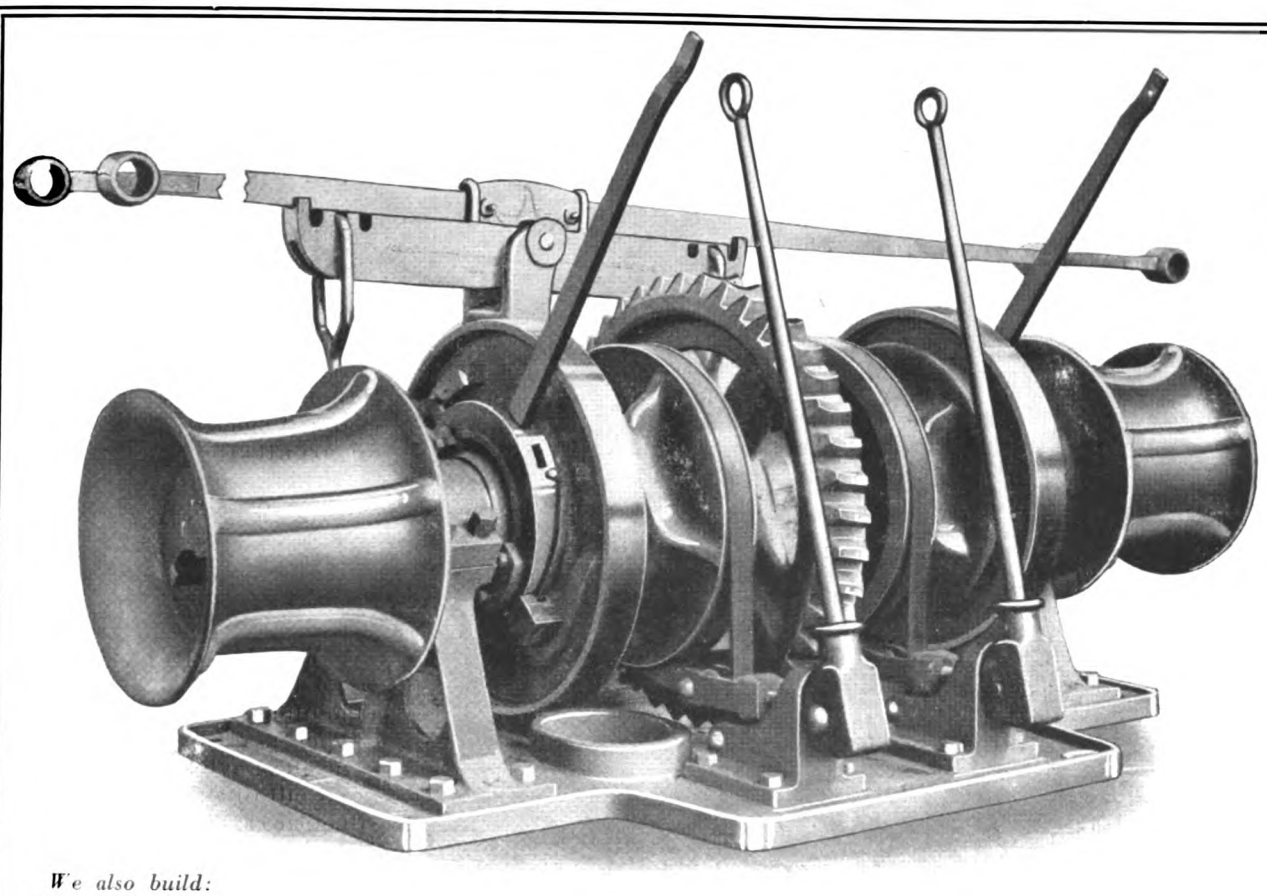

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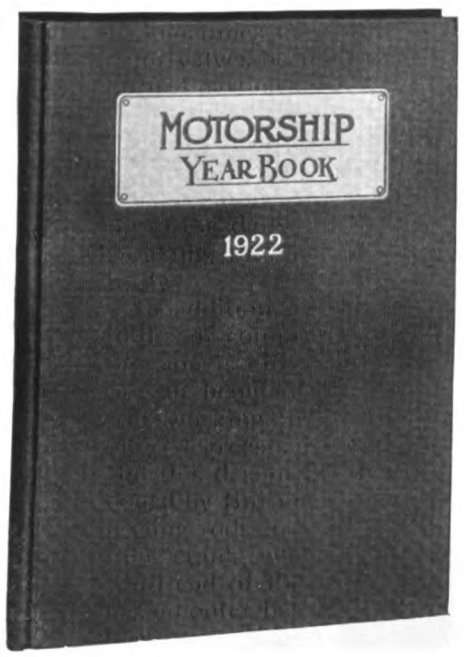

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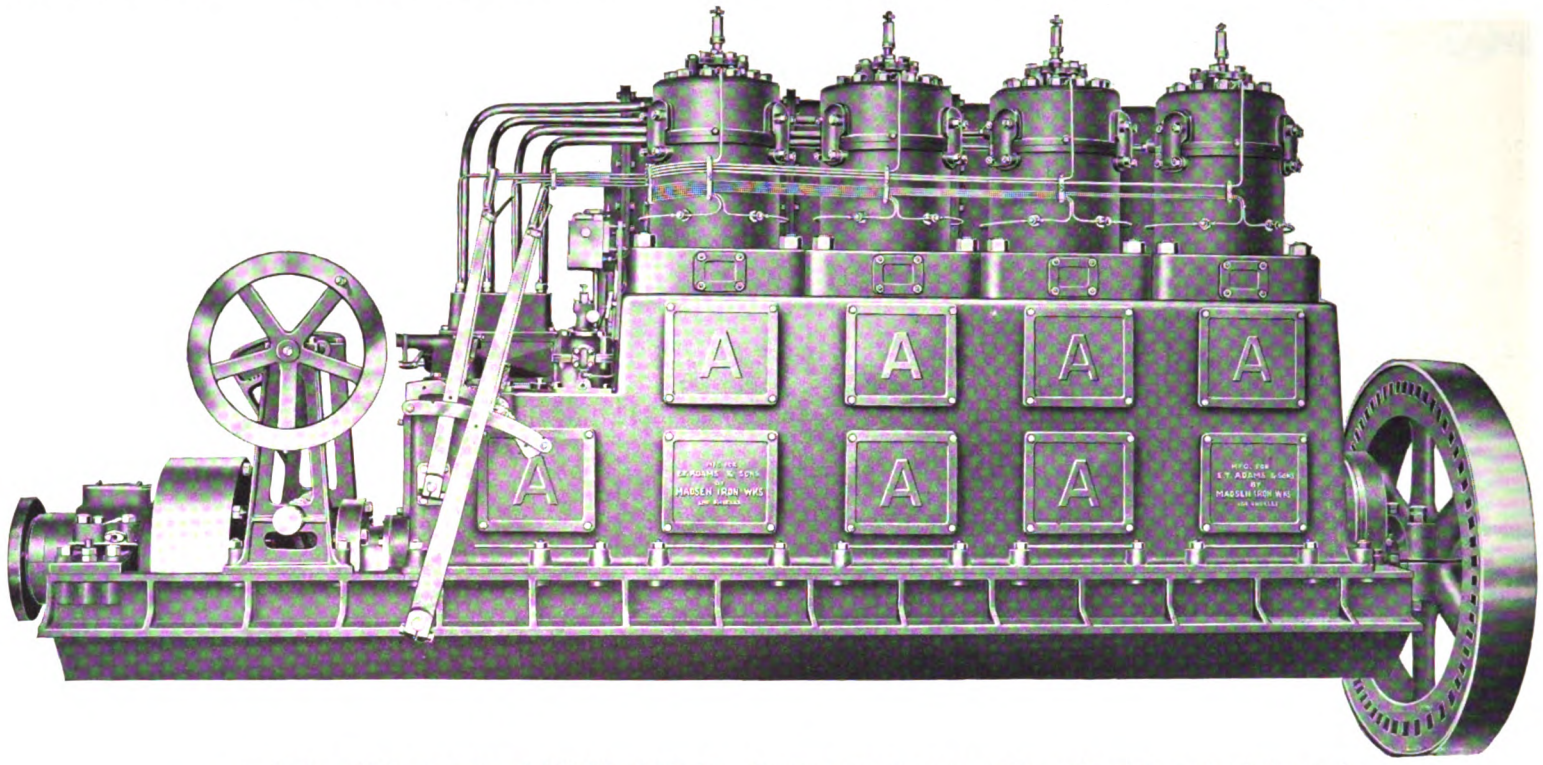
The Adams Diesel Engine



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Burns the standard asphalt base fuel oils of fourteen to twenty-six baume, completely and with high economy.

Simple to operate, easy to care for, it is an engine which may be depended upon for uninterrupted service.

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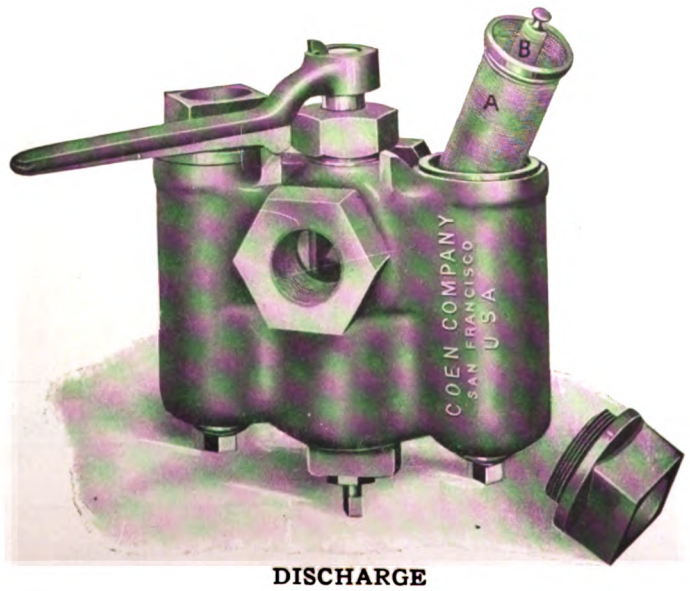

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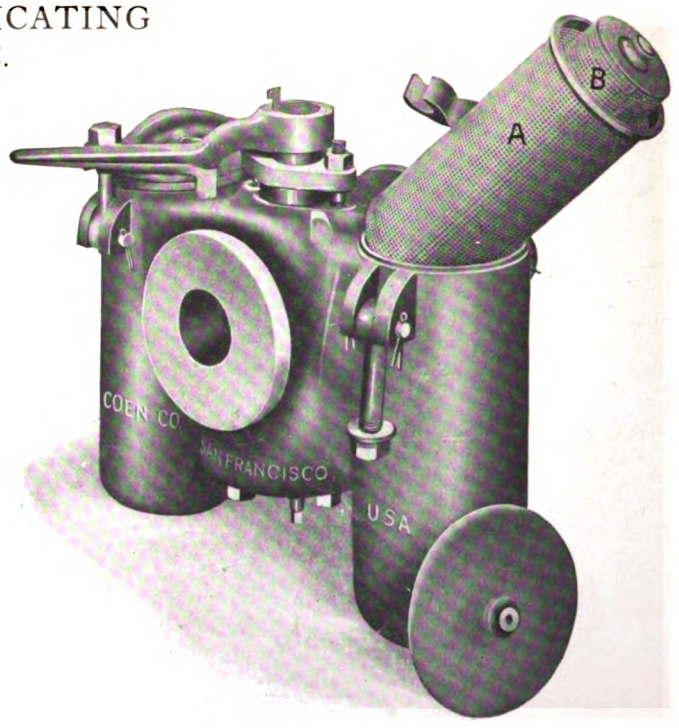

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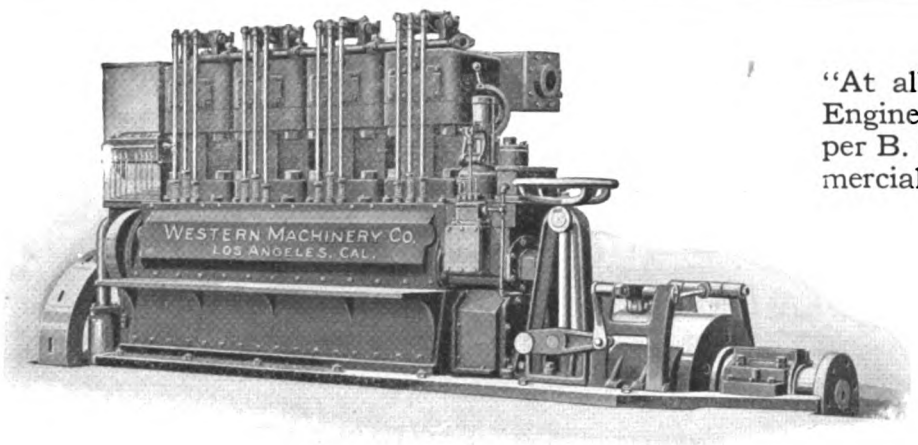

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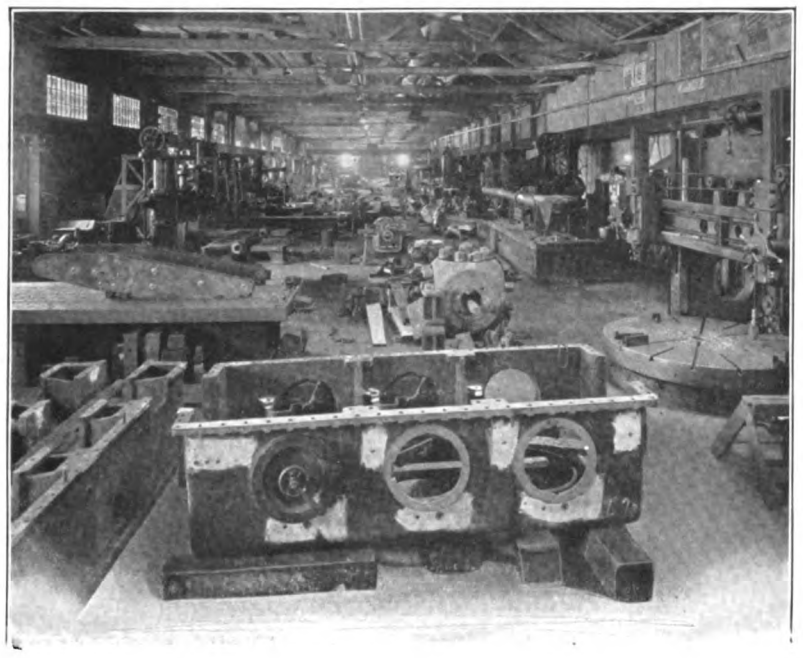

View of our Main Machine Shop and Assembly floor. (Note various classes of work under construction.)

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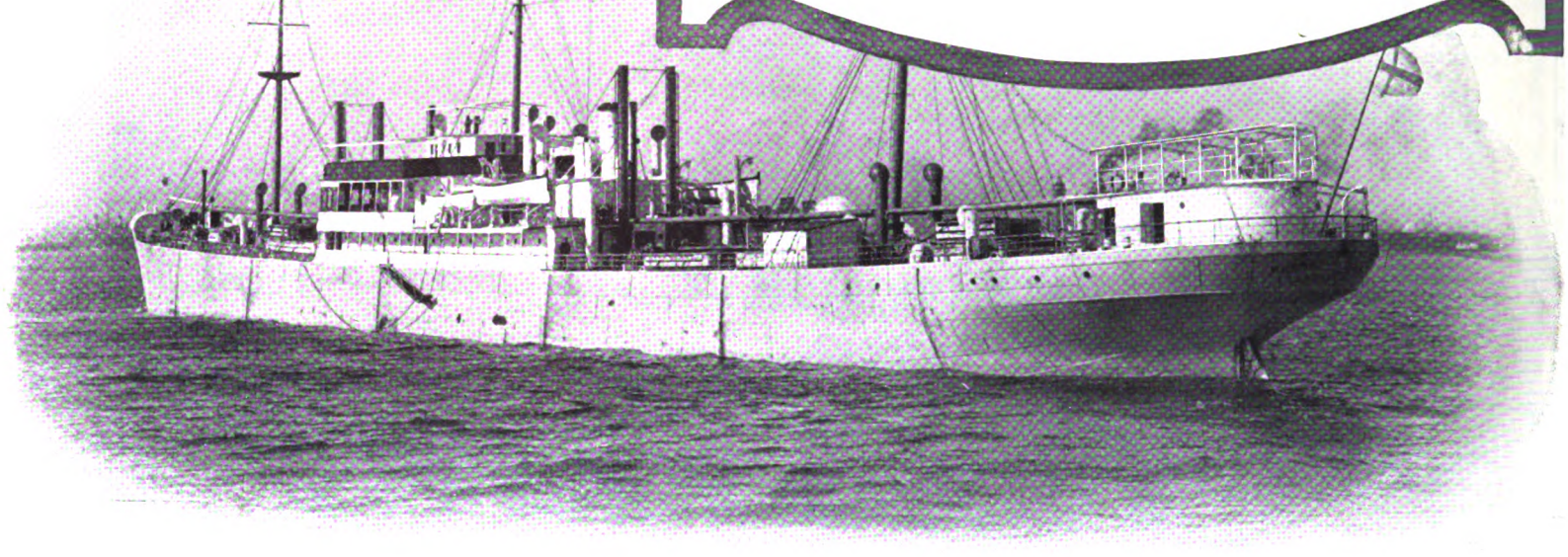

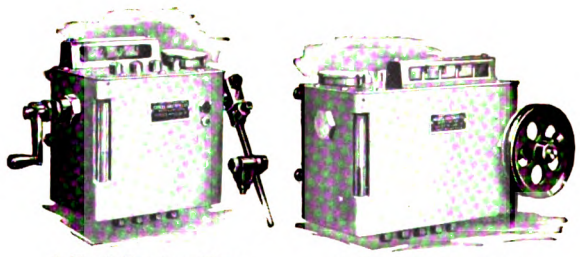

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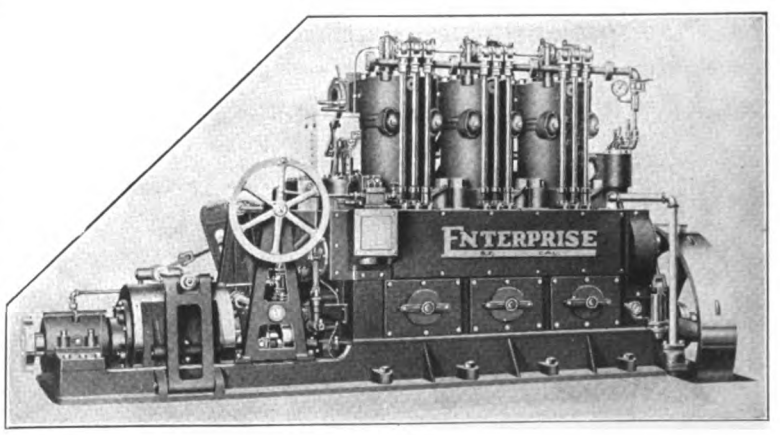

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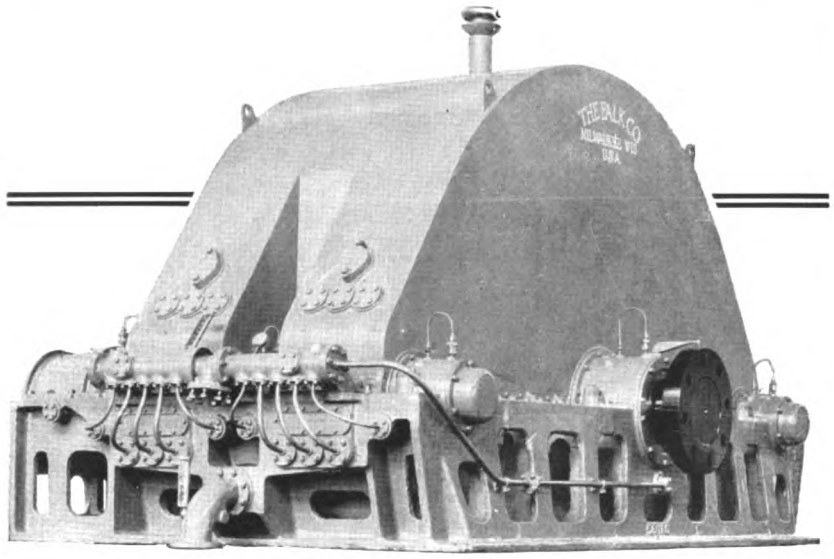

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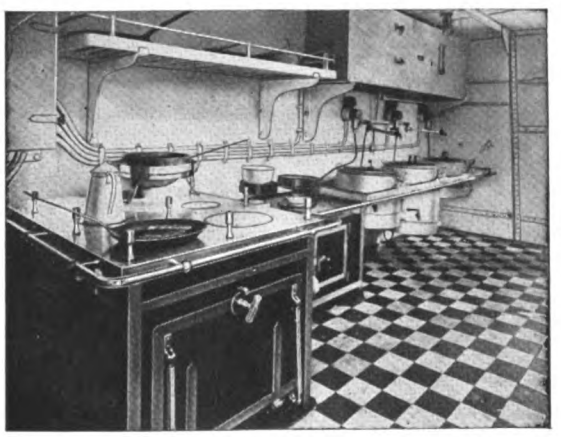

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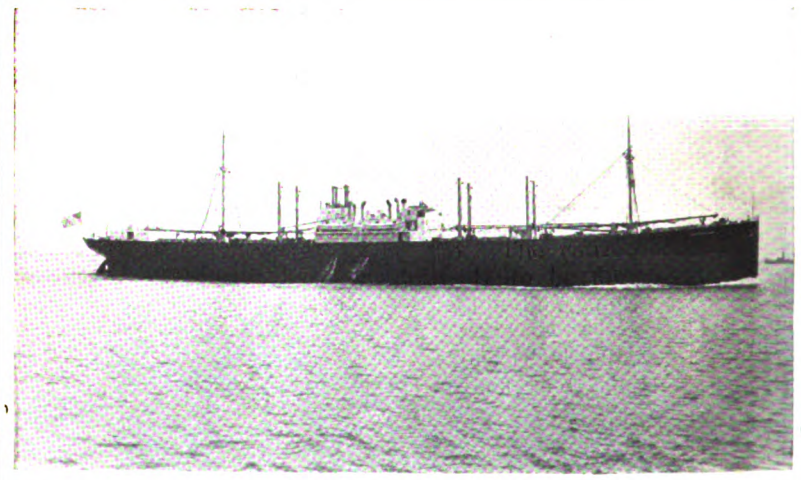

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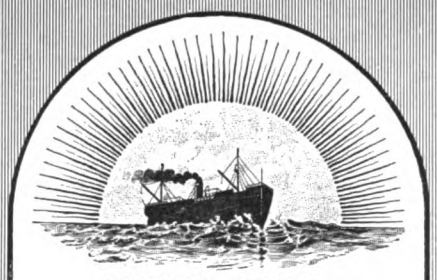

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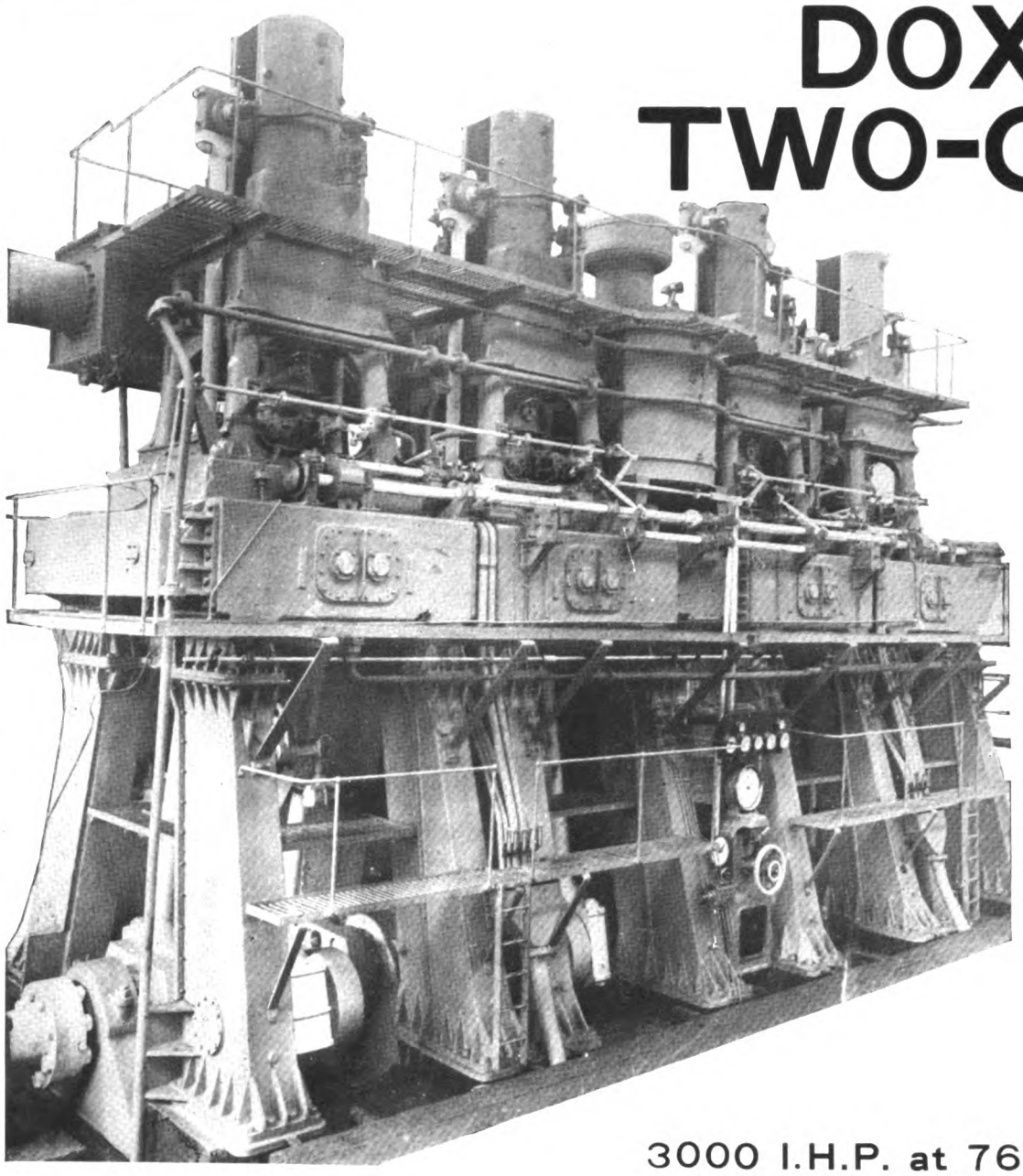

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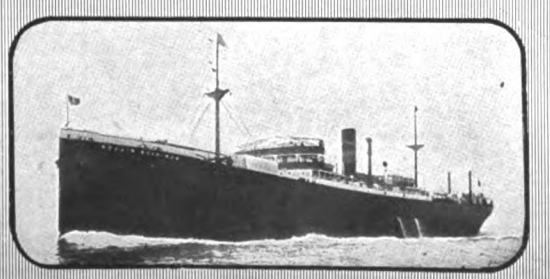

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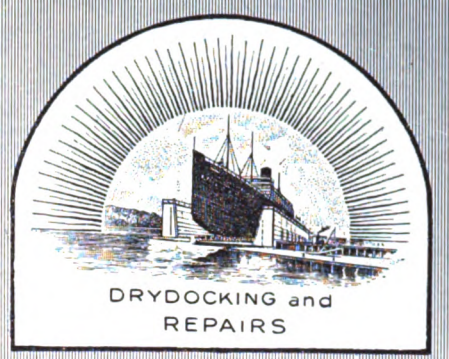

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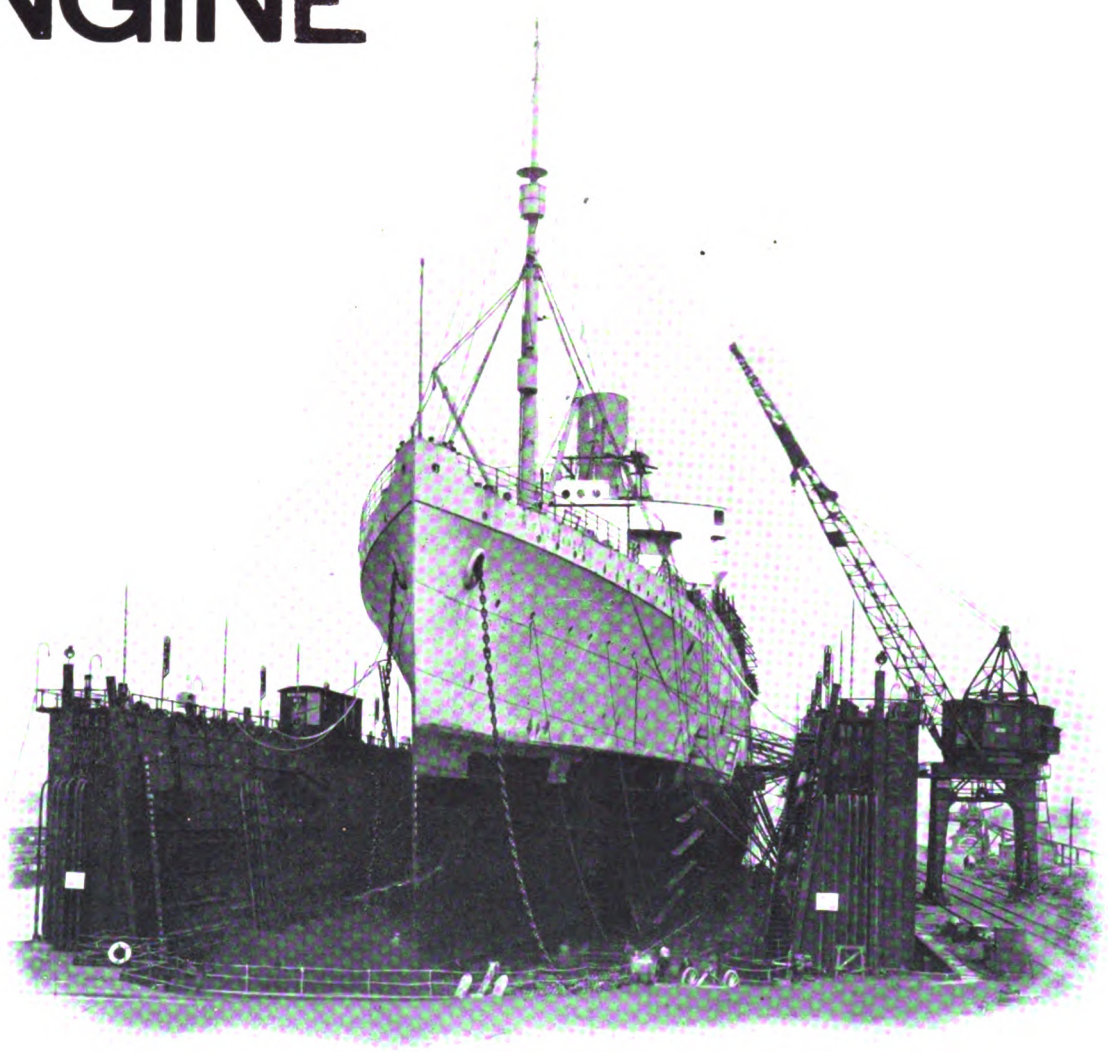

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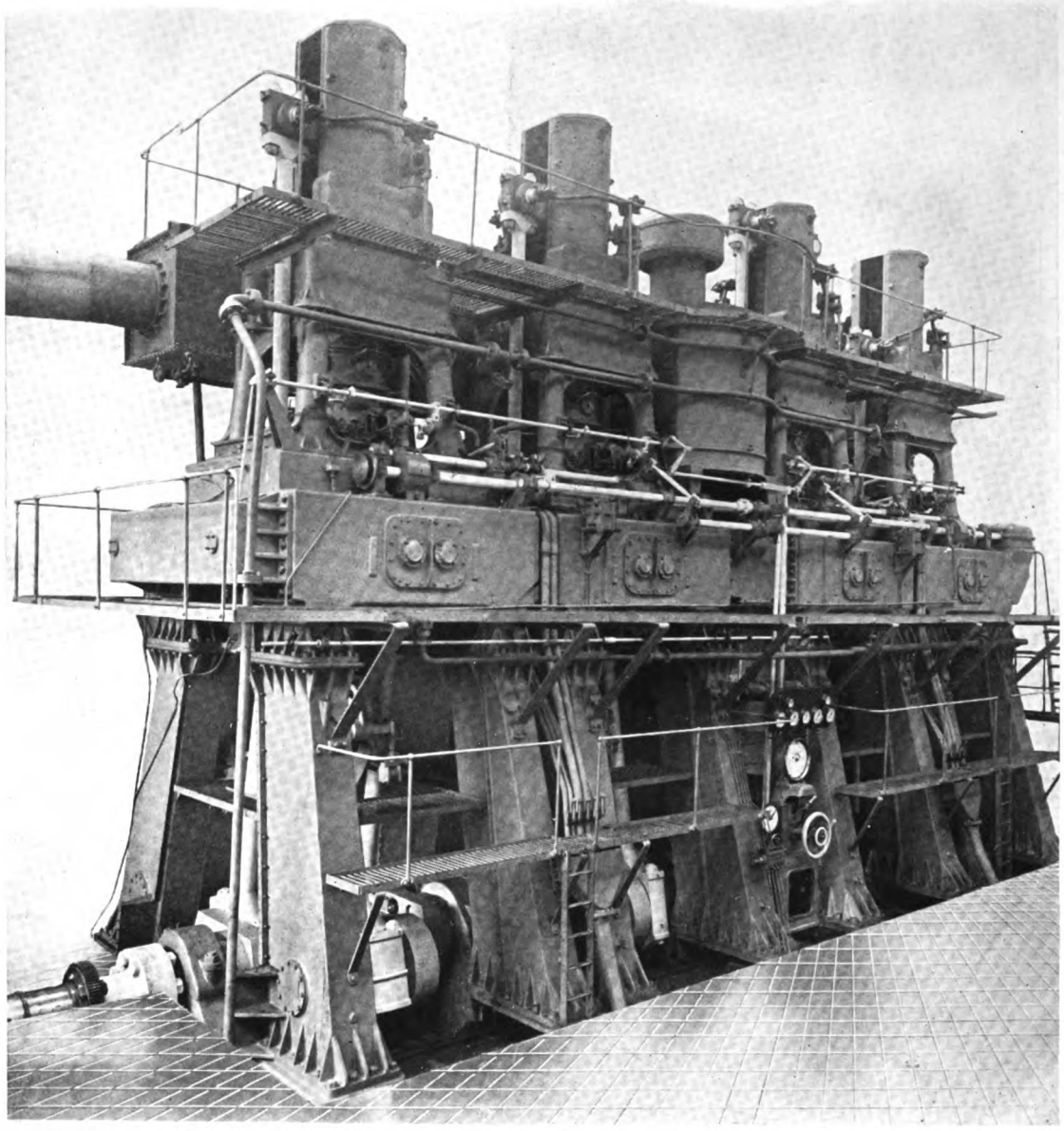

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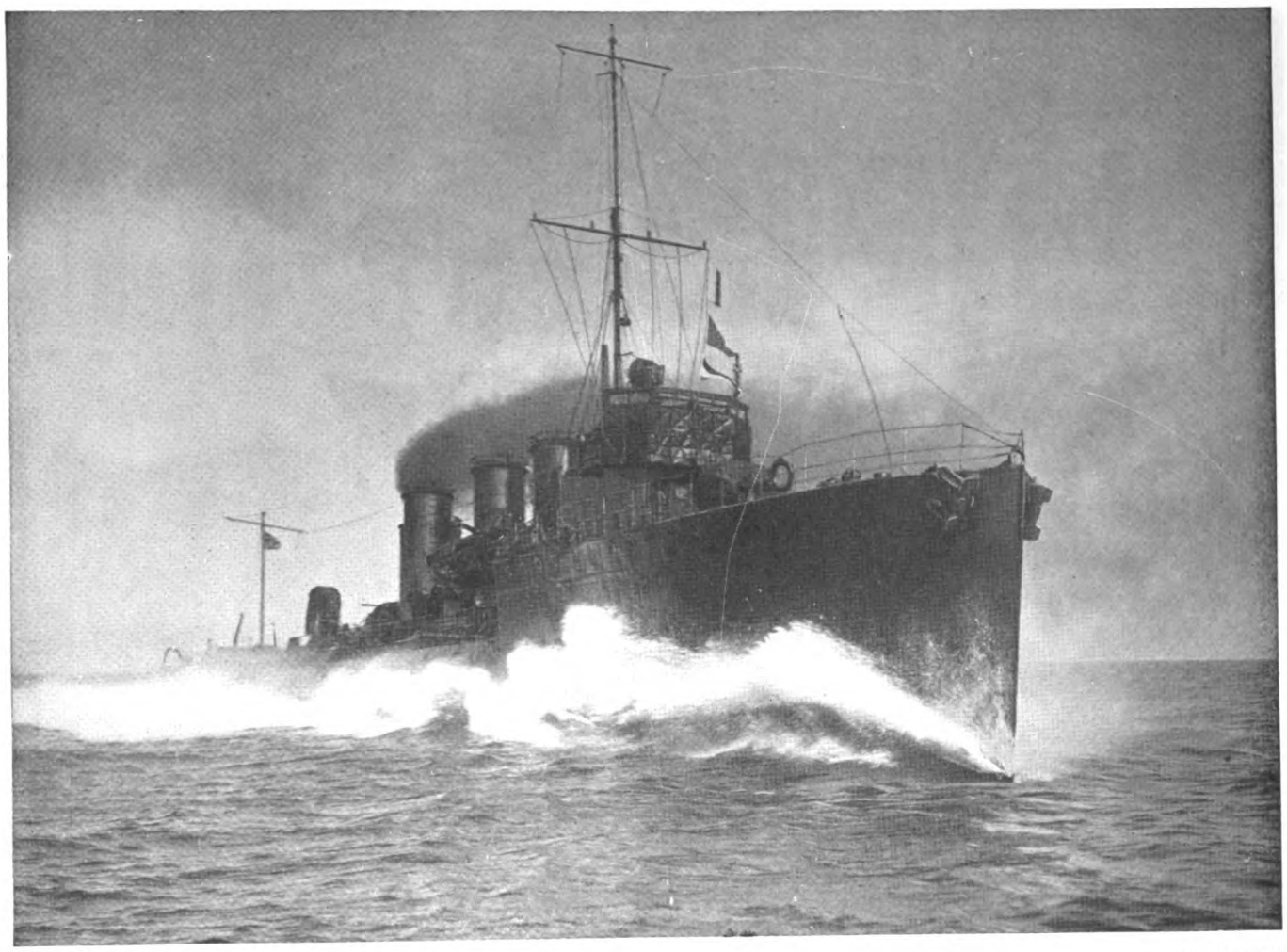
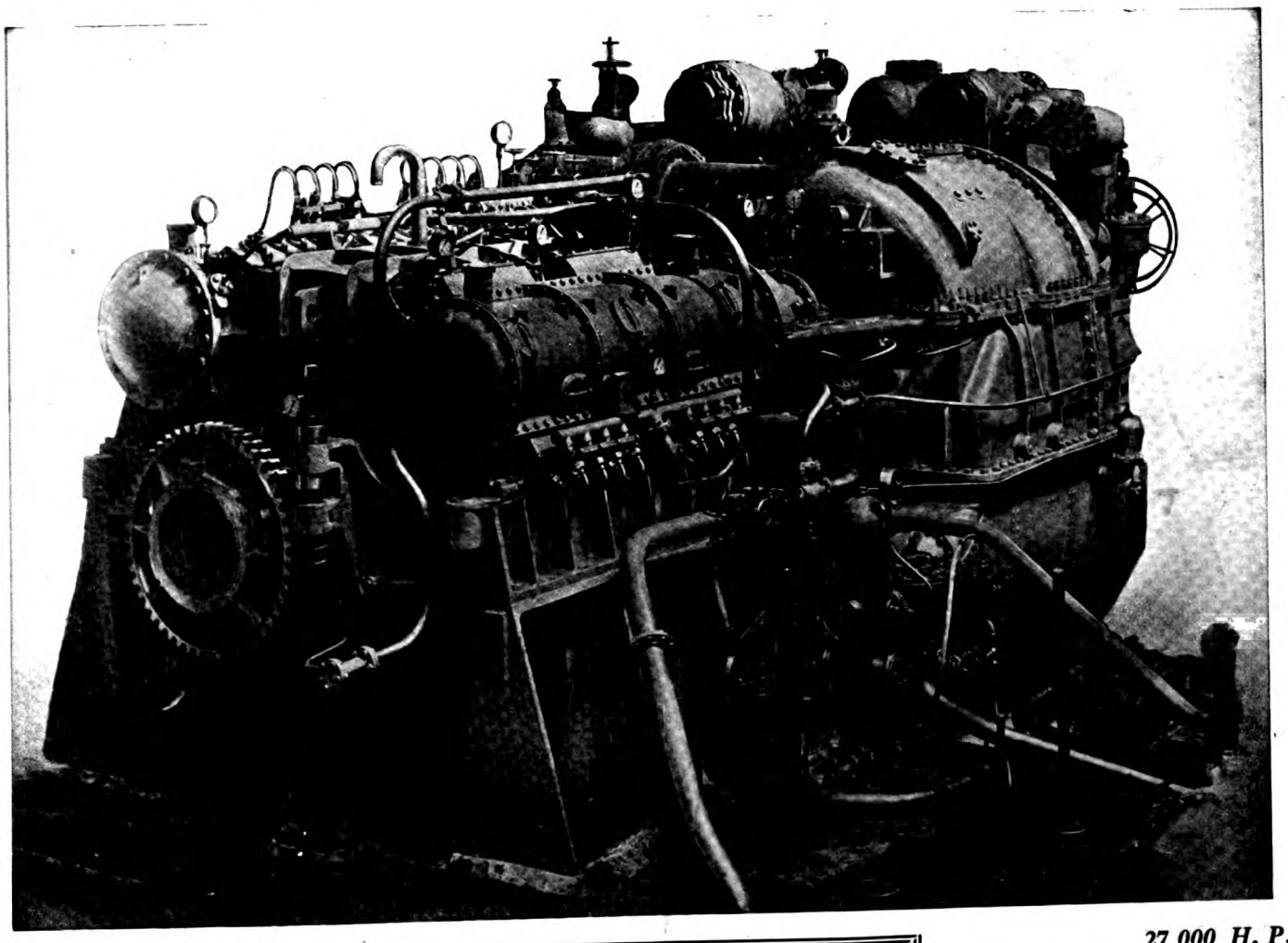


TORPEDO BOAT DESTROYERS *34 KNOTS*



GEARED TURBINES *27,000 H. P.*

1914-1919

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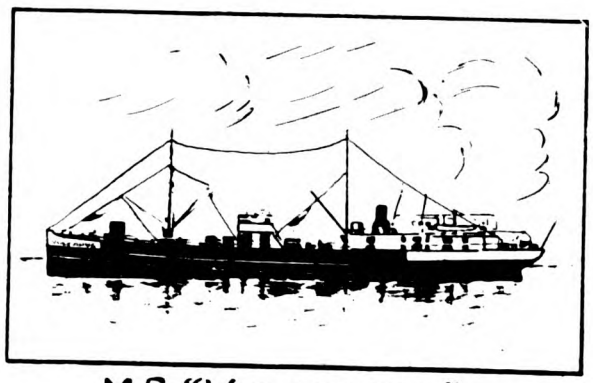
HERE IS YOUR ENGI

WHERE IS YOUR SHIP ?

"NORTH EASTERN WERKS

MARINE DIESEL ENGINES



M.S. "VULCANUS".

FACTS

THIS TYPE WAS THE FIRST TO BE INSTALLED IN ANY OCEAN GOING VESSEL VIZ:- THE "VULCANUS".

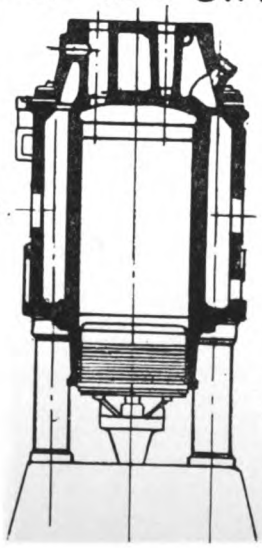
◄ FIRST IN 1910. ►

FOREMOST TO-DAY WITH 100,000 H.P. TO ITS CREDIT AND INSTALLED IN OVER 50, VESSELS. BUILT UP TO POWERS OF 4,000HP

A COOL HEADED MAN

WITH A VAST EXPERIENCE IS WORTH MANY HOT HEADED MEN WITHOUT EXPERIENCE. WHY NOT APPLY THIS TO YOUR CHOICE OF ENGINE AND ORDER A NORTH EASTERN WERKSPOOR DIESEL ENGINE

ENGINES BUILT TO PURCHASERS REQUIREMENTS BLENDED WITH OUR OWN EXPERIENCE.



NOTE THE COOL HEAD

DUE TO THE AMPLE FLOW OF COOLING WATER AROUND THE HOTTEST PART OF THE CYLINDER CROWN AND VALVES.

THIS CANNOT BE ATTAINED BY ANY DESIGN WITH A DETACHABLE COVER

THE NORTH EASTERN MARINE ENGINEERING Co LTD.

TELEGRAPHIC & CABLE ADDRESS NEWS WALLSEND.

WALLSEND-ON-TYNE. ENGLAND

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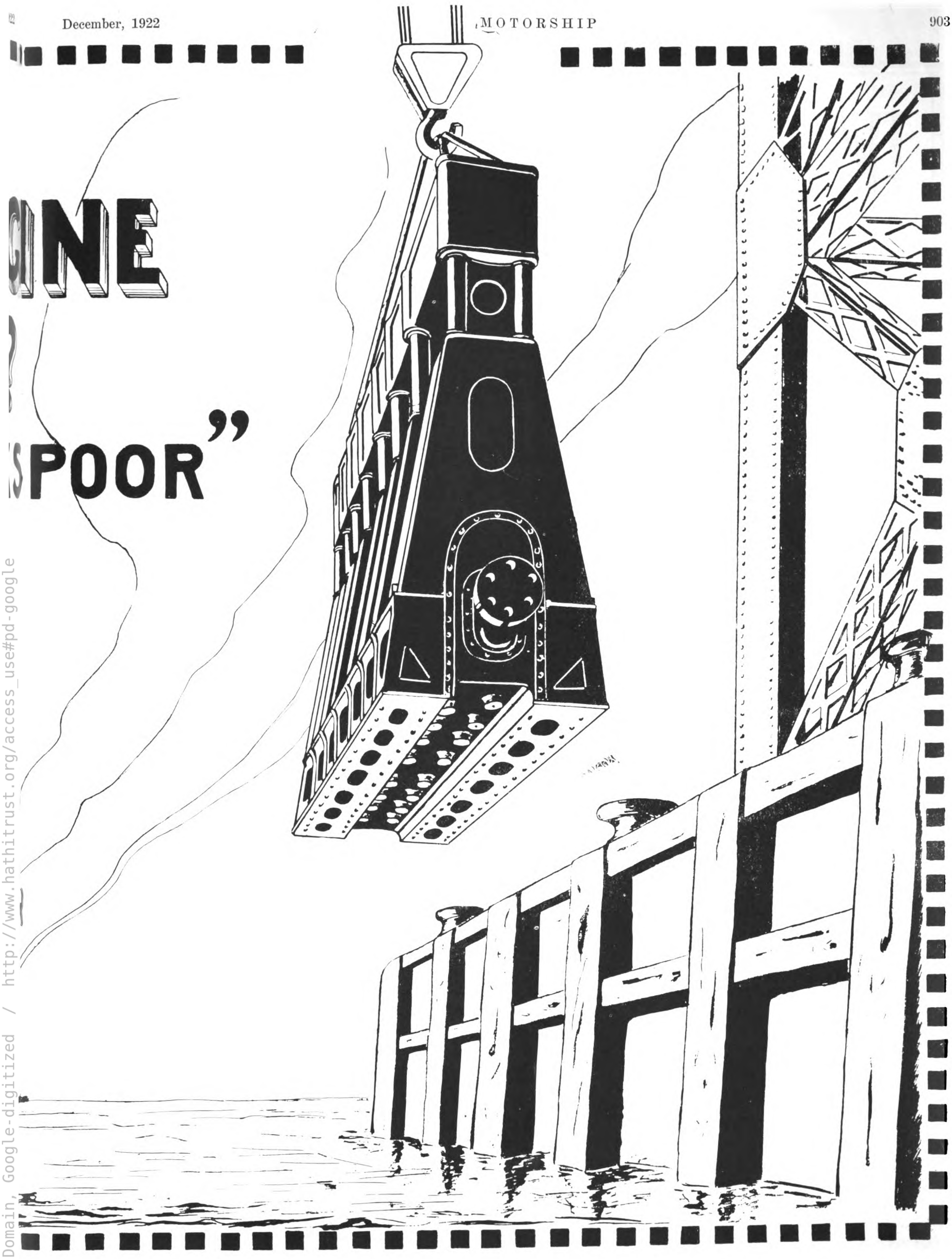

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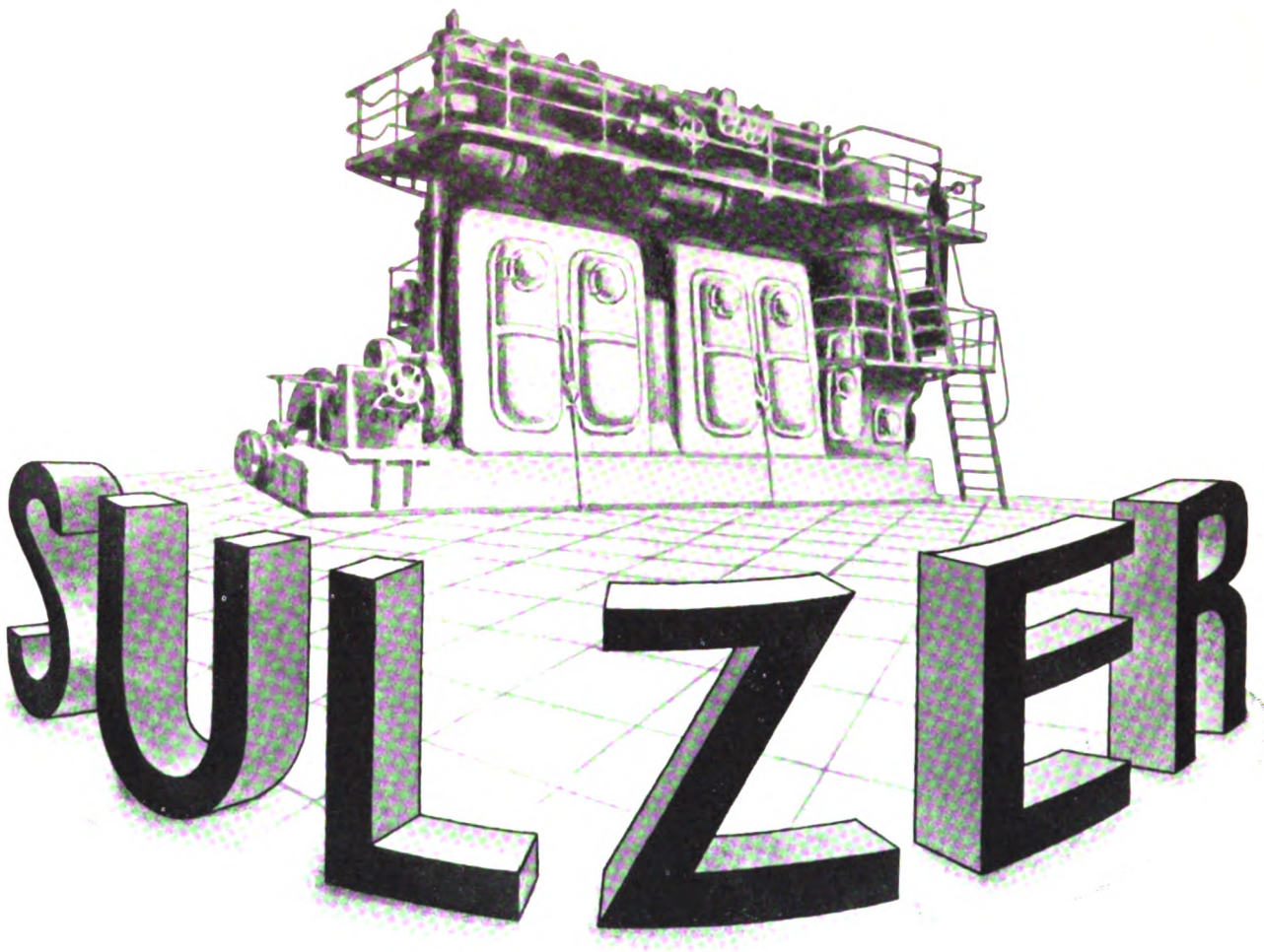
TWO-CYCLE DIESEL MARINE ENGINES



Smaller and medium-sized low-speed types
from 100—1000 HP for sailing ships, coasting and river service, medium-sized cargo-boats and passenger-ships, tugs, gun-boats, and yachts.

Large low-speed types
from 1000 to over 6000 HP per unit for ships with one, two or more propellers, for ocean going vessels such as cargo-boats, tankers, liners, etc.

SULZER FRÈRES, WINTERTHUR, SWITZERLAND
BUSCH-SULZER BROS.-DIESEL ENGINE CO.
ST. LOUIS, MO.

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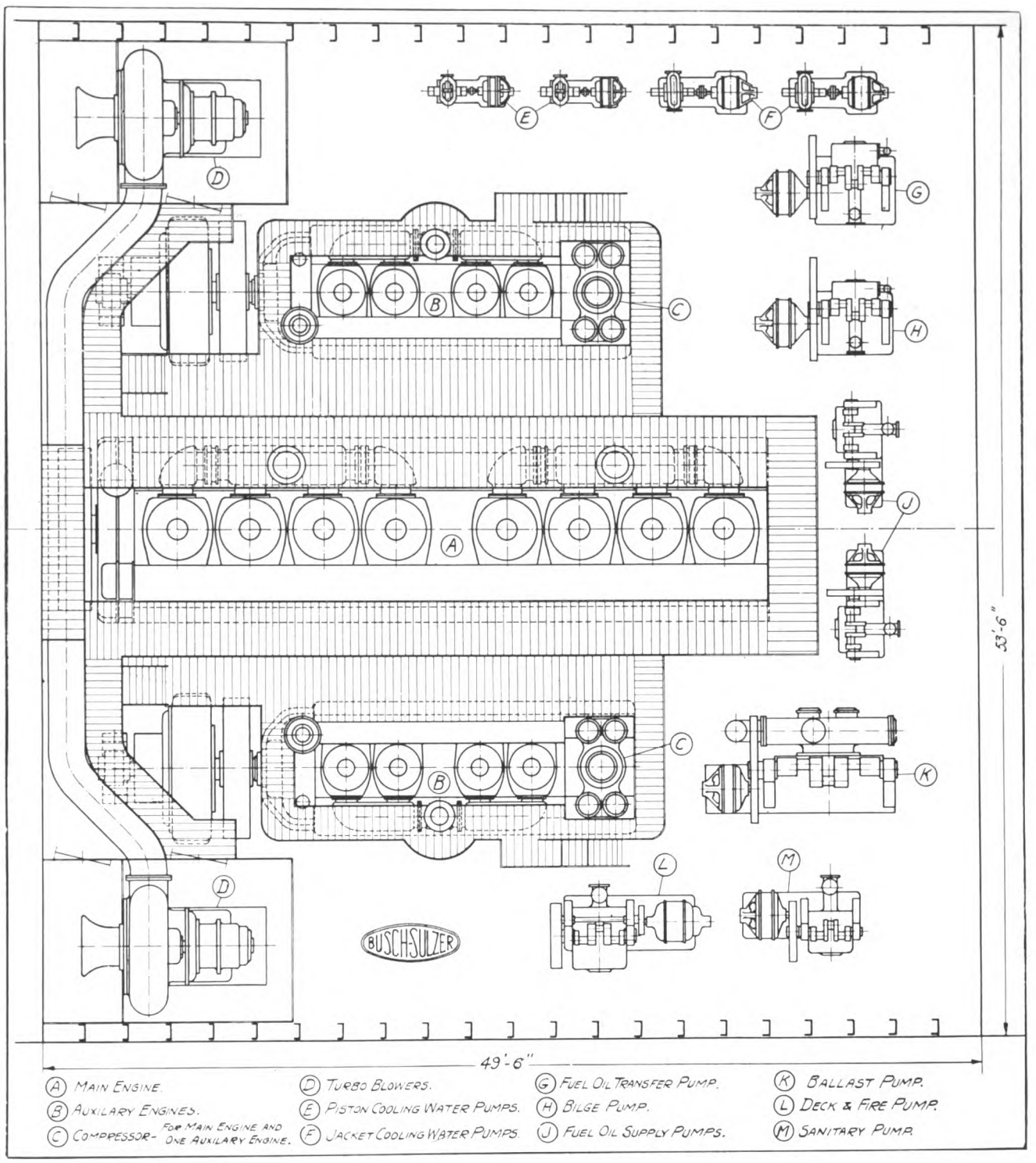

ARRANGEMENT OF

BUSCH-SULZER DIESELS

FOR

CONVERSION OF STEAMERS

TO MOTORSHIPS

SINGLE SCREW—2650 S.H.P.—90 R.P.M.

AND IN ENGINE ROOM LENGTH OF 54'-0"

TWIN SCREW—6000 S.H.P.—102 R.P.M.

HIGHER SPEED—LESS FUEL

BUSCH-SULZER BROS.-DIESEL ENGINE CO.

ST. LOUIS, MO.

EASTERN SALES OFFICE
60 BROADWAY, NEW YORK

WESTERN SALES OFFICE
RIALTO BLDG., SAN FRANCISCO

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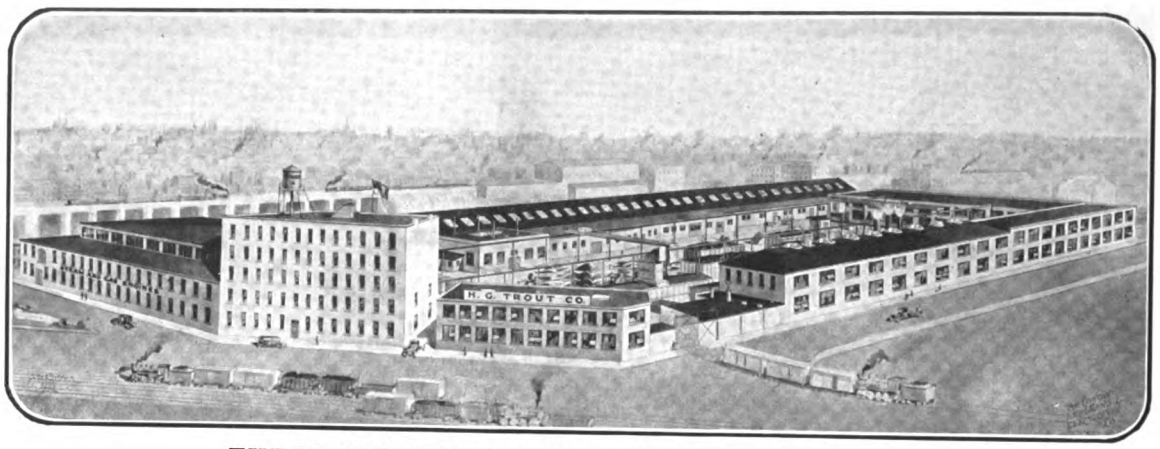
Announcing the New Product

THE TROUT

(LEISSNER COMBUS

Established 1848



THE PLANT BEHIND THE TROUT DIESEL ENGINE

THE VALUE OF AGE

in an Engineering works lies, not alone in the wealth of experience available in its records, but also in the spirit of its men. Most of our officials and mechanics learned their trades here. Many of them represent the second or third generation of employees. These satisfied and loyal men take pride in upholding our traditions of quality and practical design.

You receive these benefits when you deal with us.

OUR MAIN MACHINE SHOP

Write for further particulars to

H. G. TROUT COMPANY
220-226 Ohio Street
Buffalo, N. Y.

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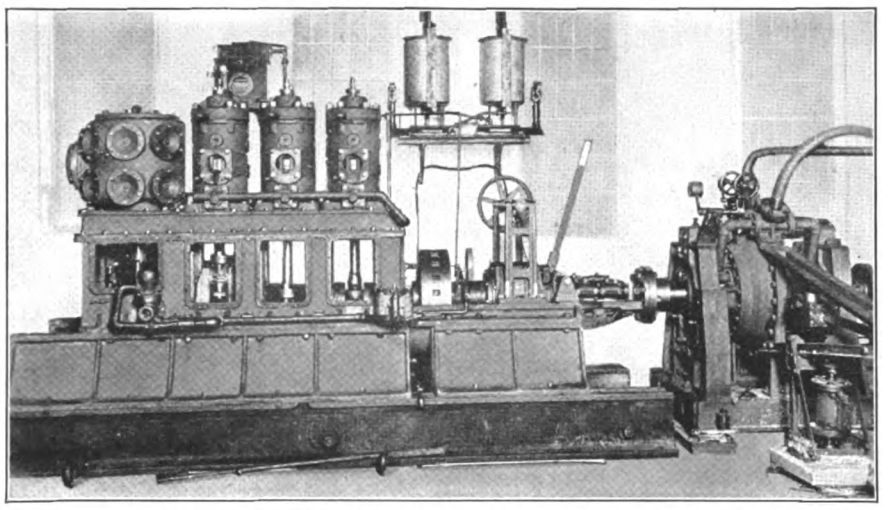
of an Old Marine Concern

DIESEL ENGINE

TION SYSTEM)



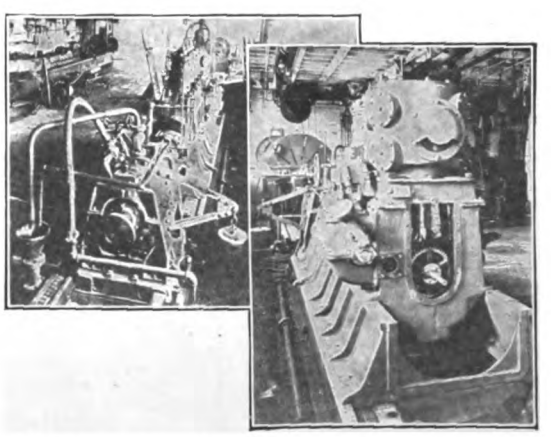
THE TROUT DIESEL ENGINE—75 TO 500 B. H. P.
(Above view shows engine nearly finished and connected to Dynamometer, ready for exhaustive tests)

Constant and close association with the marine field has demonstrated to us the ever increasing demand for the Oil Engine.

Our wide experience in Marine Steam Engine and Propeller design and manufacture, has emphasized certain essential features, which every operator of a marine engine has found to be important.

For several years we have been searching for the best combination of these features, to enable us to develop and place upon the market, an engine which would combine simplicity, accessibility, ruggedness and operating economy. We are confident that we can now offer such an engine—heavy enough to withstand the hardest service, yet with no excessive weight—and no waste of space.

The TROUT DIESEL ENGINE will uphold our reputation for building machinery, which will give uninterrupted service under the most severe conditions.



VIEWS OF ENGINE UNDER COURSE OF CONSTRUCTION
(Port and starboard sides)

Construction Features

Two Stroke Cycle. Airless Injection. Scavenge Pump.
Forced Feed Lubrication, thru hollow crankshaft.
Cylinders lubricated by timed mechanical lubrication.

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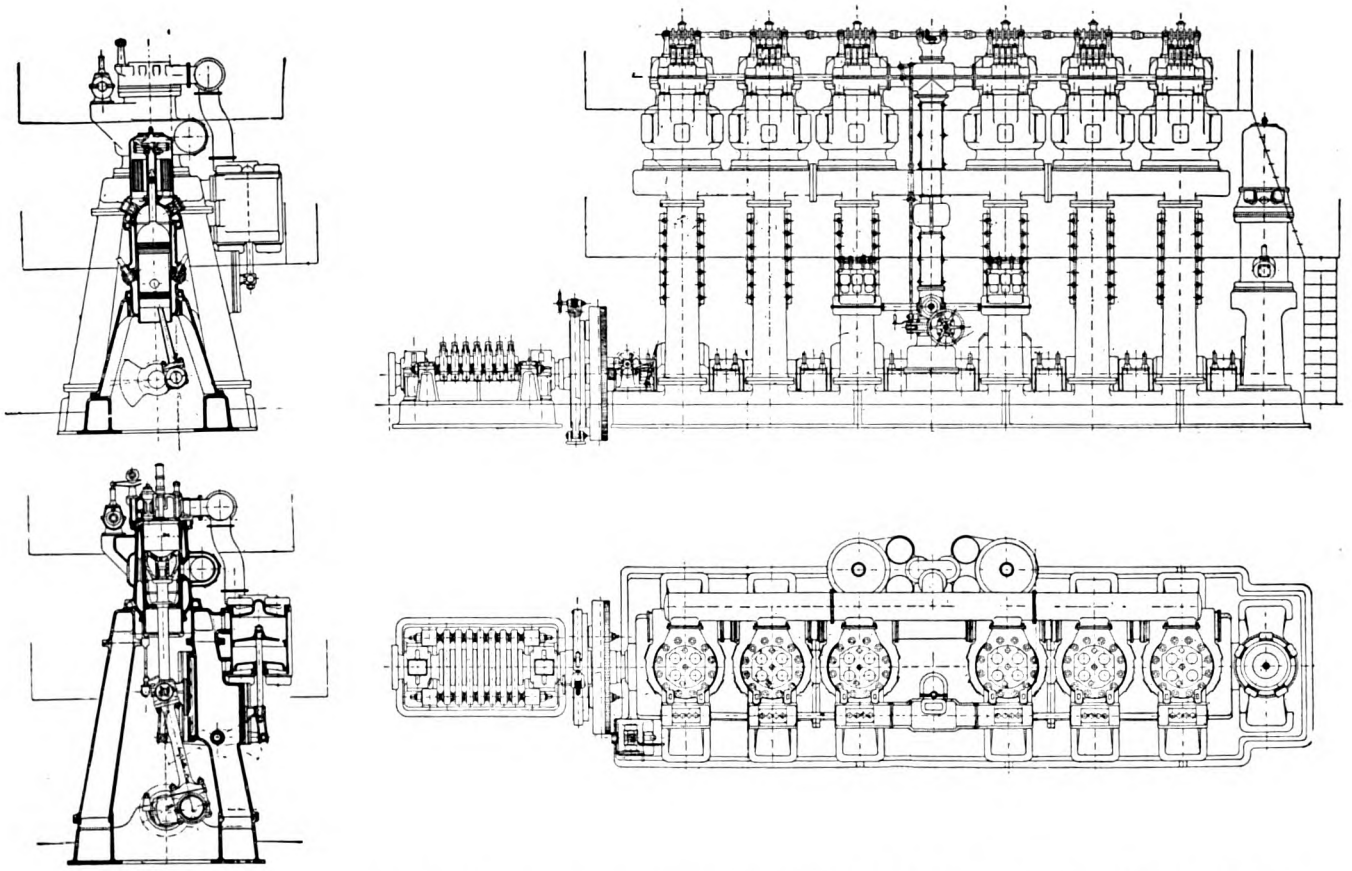
SCHNEIDER & CIE

HEAD OFFICE
42, RUE D'ANJOU, PARIS, FRANCE

NEW YORK OFFICE
21 EAST 40th STREET



General Arrangement of the Schneider 1500 Shaft H. P. Two-Cycle Type Merchant-Marine Diesel Engine. A number of these Sets are under construction.

SUCCESS in construction of high grade machinery relies mostly on judicious selection of materials used. Schneider et Cie are foremost leaders in engineering and metallurgy.

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SCHNEIDER et Cie are the largest Engineering Concern in France, and one of the greatest in the World. Back of their Diesel Engines is the Schneider reputation one century old.

MARINE ENGINES

FOR over 15 years Schneider et Cie have been engaged in the construction of Marine Diesel Engines.

FOR a considerably greater number of years they have been builders of marine steam-engines for freighters and for warships of many Navies.

THEIR experience as shipbuilders and marine engineers has been invaluable in their development of the Diesel engine in both 4-cycle and 2-cycle types.

THEY have now adopted the 2-stroke cycle for engines of large power which have been built up to 1500 bhp, both in the slow-speed crosshead type as well as in the high-speed submarine type, and they are prepared to construct up to 3500 shaft H. P. per engine, or 7000 shaft H. P. per twin-screw set for merchant ships.

Applications for American Licenses and for quotations on Engines should be made to

FRAMERICAN INDUSTRIAL DEVELOPMENT CORPORATION

21 EAST 40th STREET, NEW YORK

Exclusive Representative

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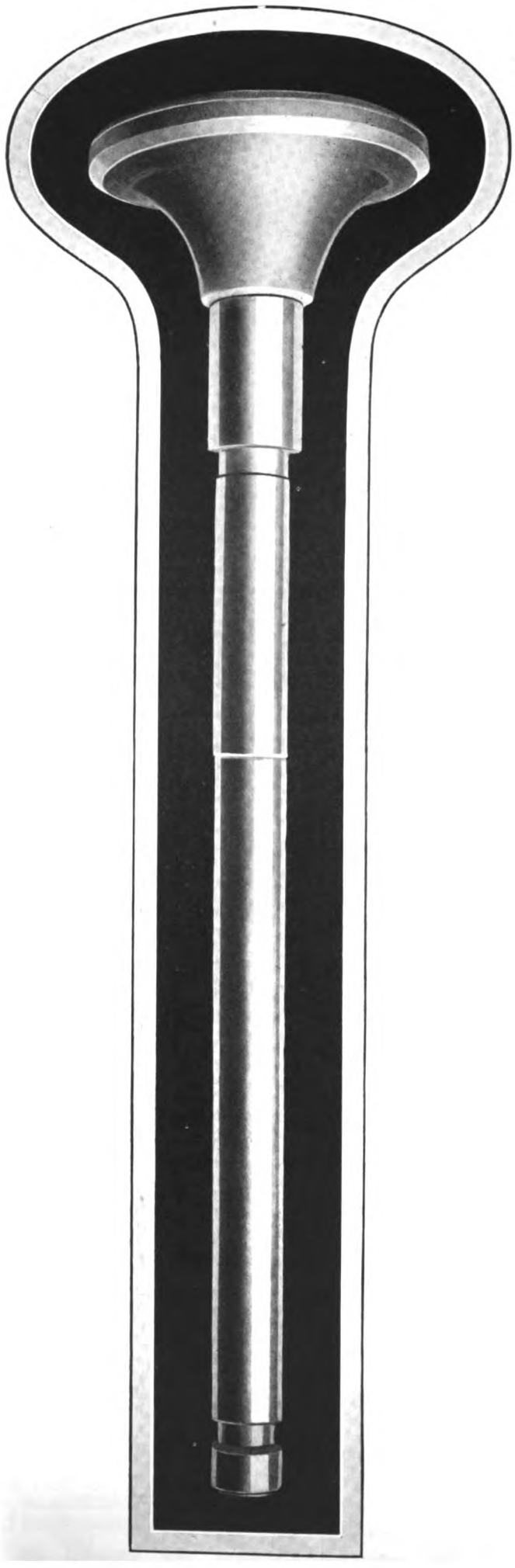

Nichrome

TRADE MARK REG. U. S. PAT. OFF.

The Valve for Perpetual Power

Under the most severe operating conditions Nichrome Valves have been in service for more than 30,000 miles with no attention—and still going.

Nichrome has extreme strength at high temperatures, and no affinity for carbon.

Nichrome Valves do not scale, pit, harden, anneal or become distorted. These valves enable you to use low grade fuel oils.

Put Nichrome Valves in your engines and forget them—indefinitely.

Send blue prints of your requirements and get specific details—without obligation.

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HARRISON, NEW JERSEY
Chicago - Detroit - Canada - England - France

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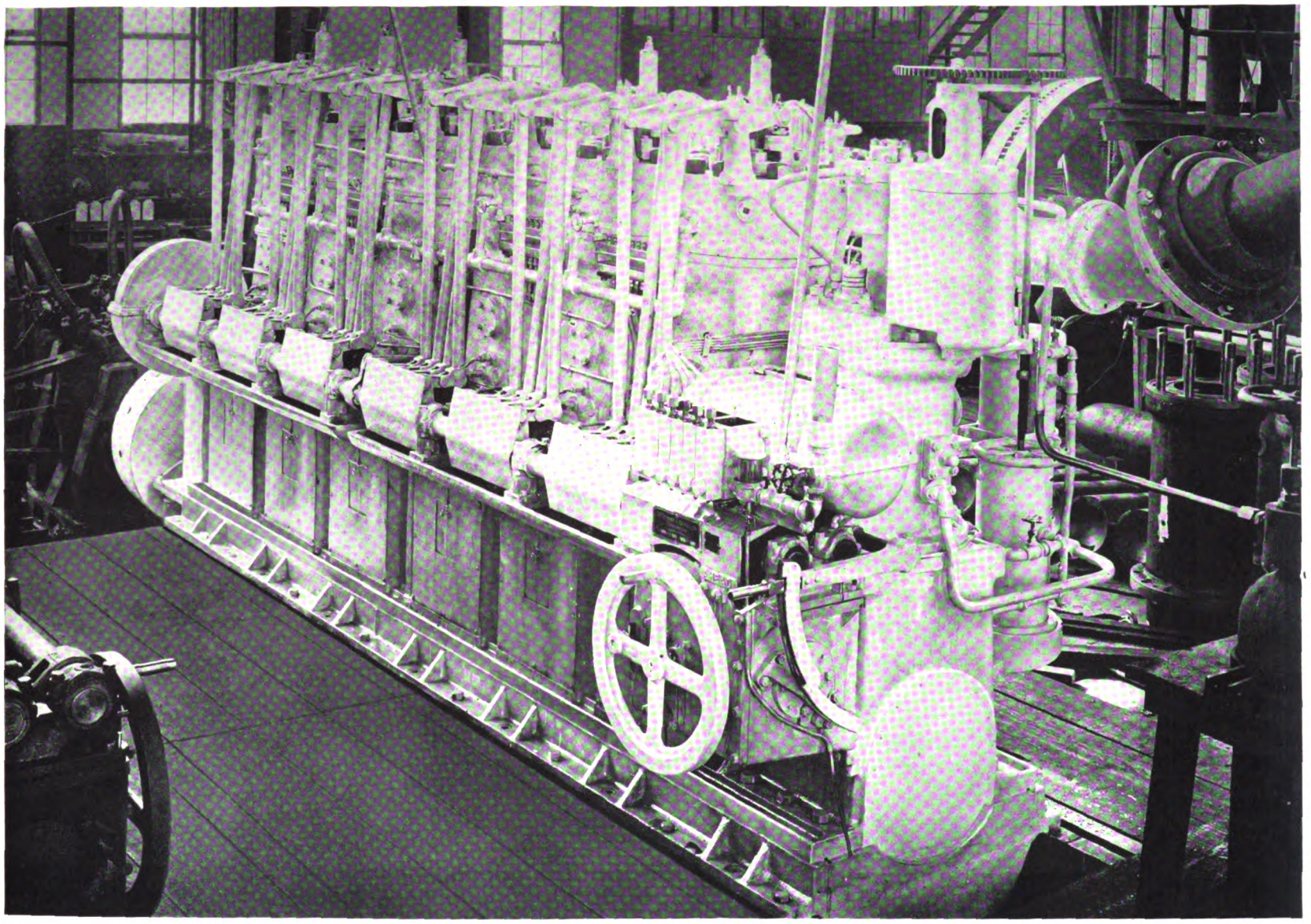
McINTOSH & SEYMOUR CORPORATION
DIESEL MARINE ENGINES



The illustration on the front cover of this magazine shows the Motorship "TEXACO 147" of the Texas Steamship Company of New York City. The "TEXACO 147" is 156 feet long, 24 feet beam, and 11 feet 4 inches full load draft, and has a deadweight capacity of one thousand tons.

This is a single-screw vessel, and is equipped with one of our 390 indicated horsepower Diesel marine engines illustrated above, which gives her a full-load speed at sea of about nine knots.

This vessel is a very good illustration of what can be done with a vessel of moderate capacity and with moderate draft so as to be suitable for use in a river or canal as well as for service at sea. It has been found that with this vessel, which encounters ice at times in winter, the prompt maneuvering of the Diesel engine facilitates greatly the handling of the vessel under these conditions.

Write for Bulletin No. 66, "Achievements in Motorships."

MAIN OFFICE AND WORKS

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149 BROADWAY
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412 BISBEE BLDG.
Jacksonville, Fla.

700 INTERSTATE BLDG.
Kansas City, Mo.

325 HUMBLE BLDG.
Houston, Texas

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PERFORMANCES OF GÖTAVERKEN MOTORSHIPS

No. 4 THE M.S. "TISNAREN"

9,400 tons d. w. Owners: Transatlantic Steamship Company, Göteborg

Date of delivery	Dec. 21st, 1918
Distance travelled	abt. 190,000 naut. miles
Power	4,130 I. H. P.
Average speed	12.6 knots
Maximum speed	14.7 "
Daily fuel consumption (incl. auxil.)	13.9 tons
Cruising radius	30,000 naut. miles

REMARKS

The M.S. "Tisnaren" is a sistership to the M.S. "Bullaren," owned by the same company. The ship has been in constant service since the date of delivery, with the exception of a period of 4 to 5 months, when the ship had to undergo considerable repairs after a fire in the harbour of Surabaya. At this occasion the ship had a cargo of copra, which caught fire. To extinguish this fire the ship was sunk. In spite of this the vessel could resume her sailings a fortnight after the accident. Owing to the lack of tonnage during the war, the repairs were postponed until after the second arrival in Göteborg, about 12 months later

BUILT AND DIESEL-ENGINED BY THE GÖTAVERKEN

GÖTAVERKEN

GÖTEBORG - SWEDEN

SHIPBUILDERS AND DIESEL-ENGINE CONSTRUCTORS

LARGEST FLOATING DRY-DOCK IN SCANDINAVIA

LIFTING CAPACITY 13,000 TONS

GÖTEBORG SWEDEN GÖTAVERKEN

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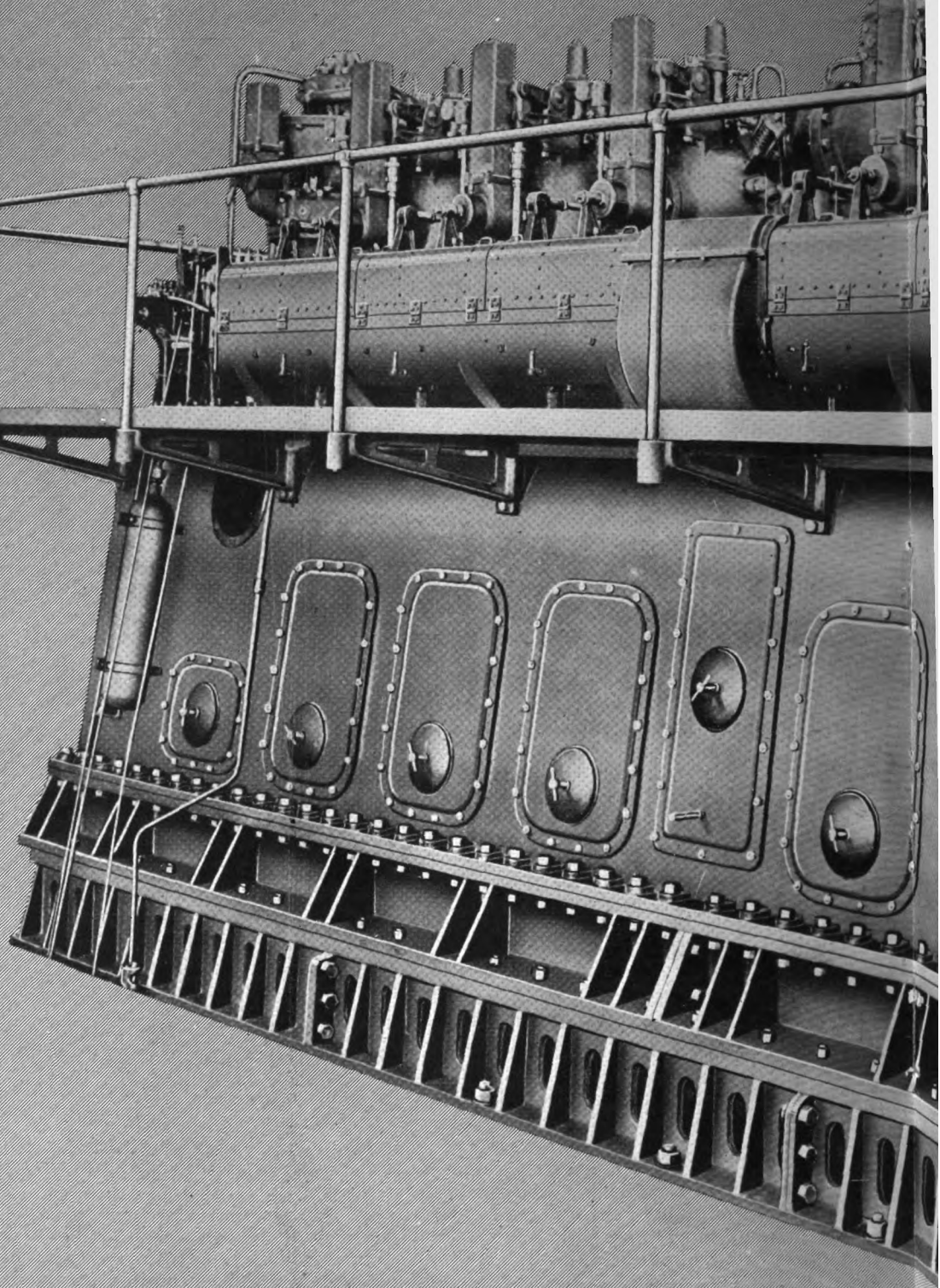
NELSECO DIESEL ENGIN



SIZES
FOR EARLY DELIVERY
120 H.P., 180 H.P.
240 H.P., 360 H.P.
480 H.P.

600-750 B.H.P., 225 R.P.M., 4 cycle, 6 cylinders
HEAVY-DUTY MARINE OR STATIONARY DIESEL ENGINE

NELSECO

New London Ship
Groton,

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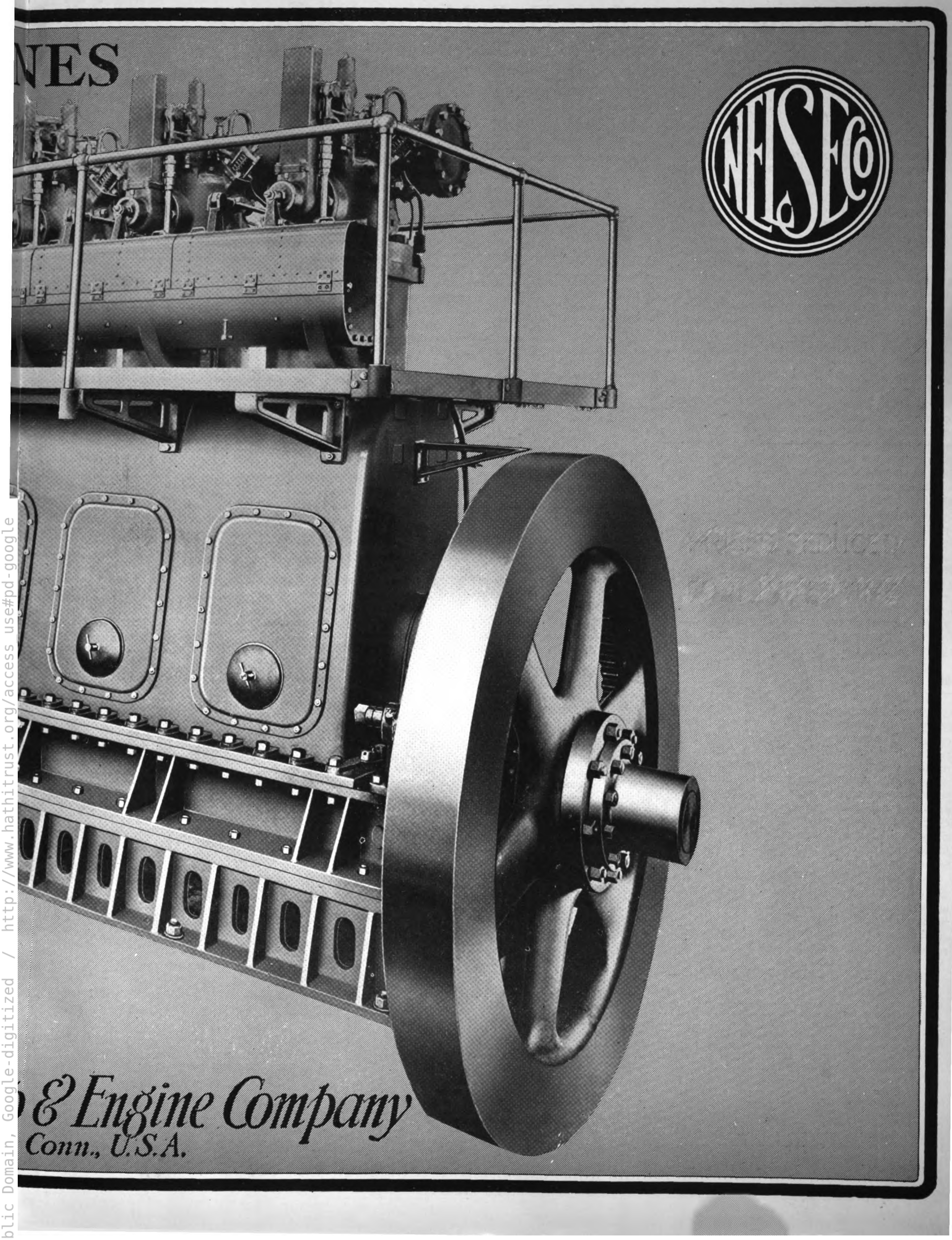

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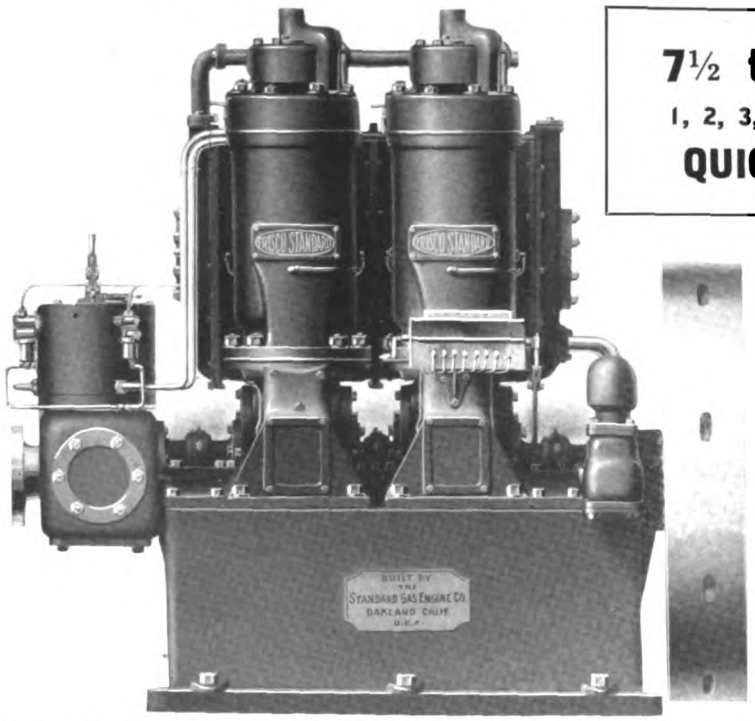
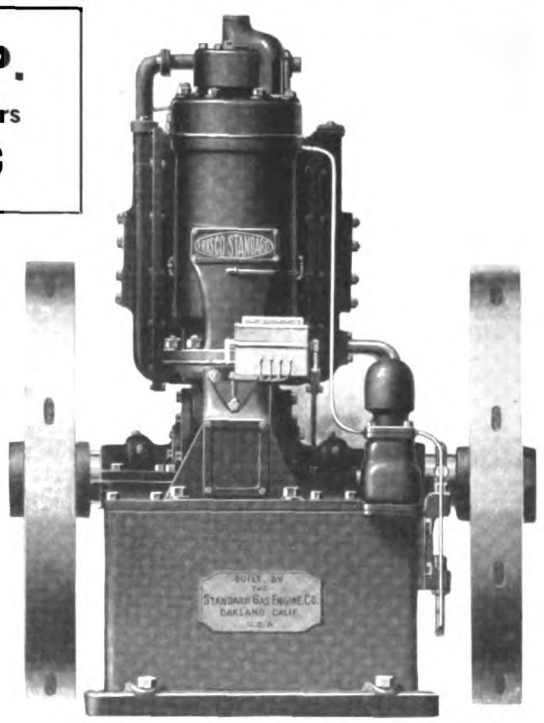
THE OLD RELIABILITY **FRISCO STANDARD** THE NEW ECONOMY

PROPELLING-POWER for small vessels
For all vessels SHIPS' AUXILIARIES

7½ to 300 H. P.
1, 2, 3, 4, and 6 Cylinders
QUICK STARTING



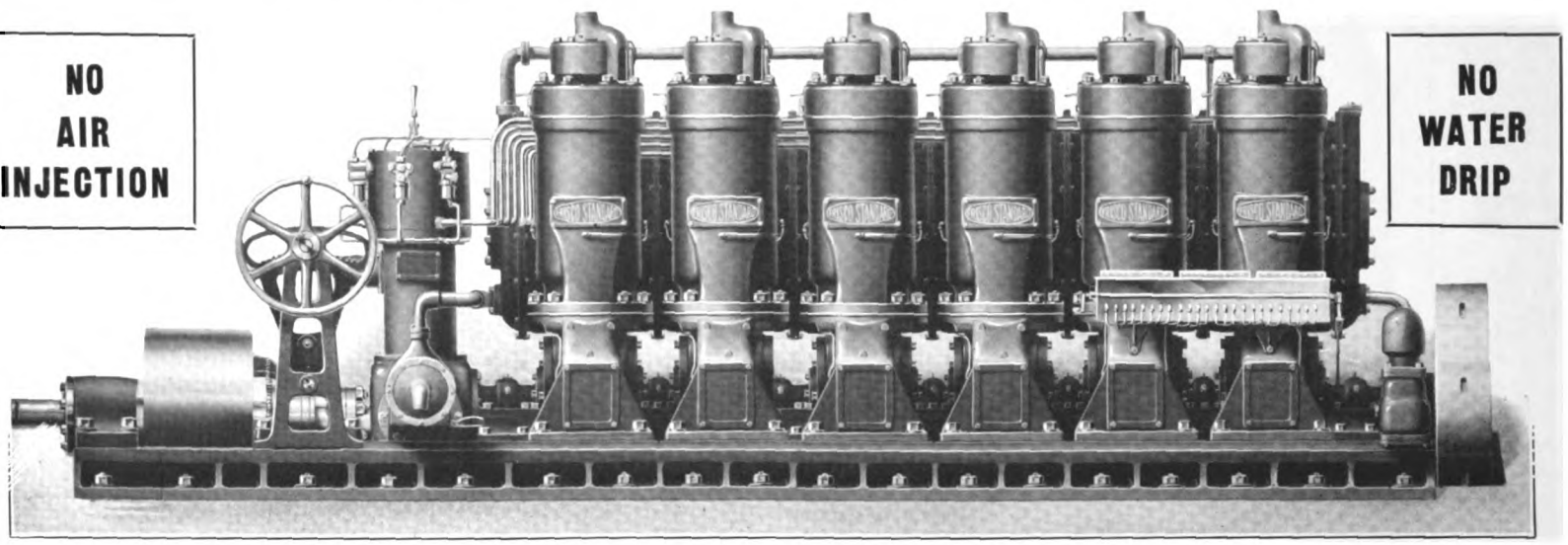
Two Cylinder Stationary Engine, Built in Sizes 15, 25, 35, 50, 75 and 100 Horsepower



Single Cylinder Stationary Engine, Built in Sizes 7½, 12½, 17½, 25, 37½, and 50 Horsepower

NO AIR INJECTION

NO WATER DRIP



Six Cylinder Marine Engine, Built in Sizes 55, 75, 115, 150, 225 and 300 Horsepower

The Semi-Diesel Surface Ignition Heavy Oil Engine, of which the "FRISCO STANDARD" represents the most advanced type, is indisputably the preferred power for small boats, and vessels requiring 300 horsepower, or less, in a single screw, and 600 horsepower, or less, in twin screws.

Because of their extreme simplicity of construction and operation "FRISCO STANDARD" Stationary Engines are also much preferred as ships' auxiliaries, for driving hoisting machinery, generating electricity, driving air compressors, pumps, etc.

The new improved Frisco Standard heavy oil engine is built in sizes from 7½ to 300 h.p., one to six cylinders, for both marine and stationary purposes. In every respect, the features that have characterized the Frisco Standard distillate engine for years and made it the world's leader among work boat engines, have been carried out in the design and construction of the heavy oil engine.

Frisco Standard dimensions are everywhere much larger than is ordinarily considered necessary in oil engine practice; horse power ratings are exceedingly conservative; accessibility of parts has been made one of the prime considerations and the unit system of construction, combined with the machining of all parts to jigs and gauges, assures absolute interchangeability and minimizes cost of material with little time lost in effecting replacements.

Send for Heavy Oil Engine Catalog just off the Press and name of nearest Frisco Standard Dealer

Dennison & King Streets **STANDARD GAS ENGINE CO.** Oakland, Cal., U. S. A.

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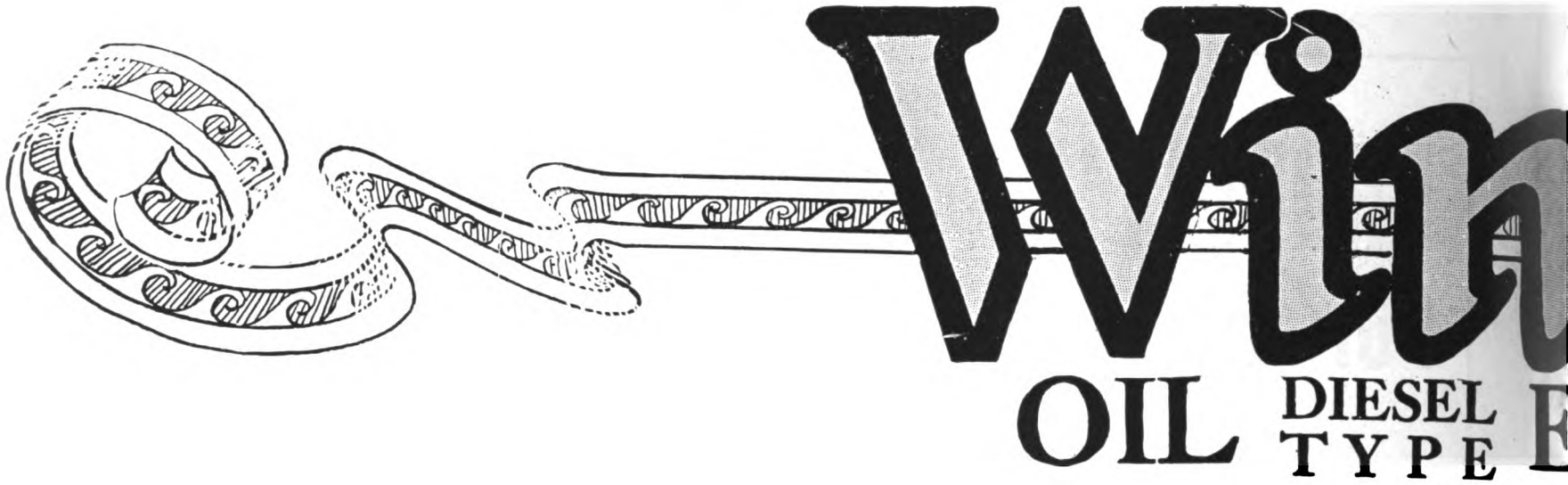


COLLEEN

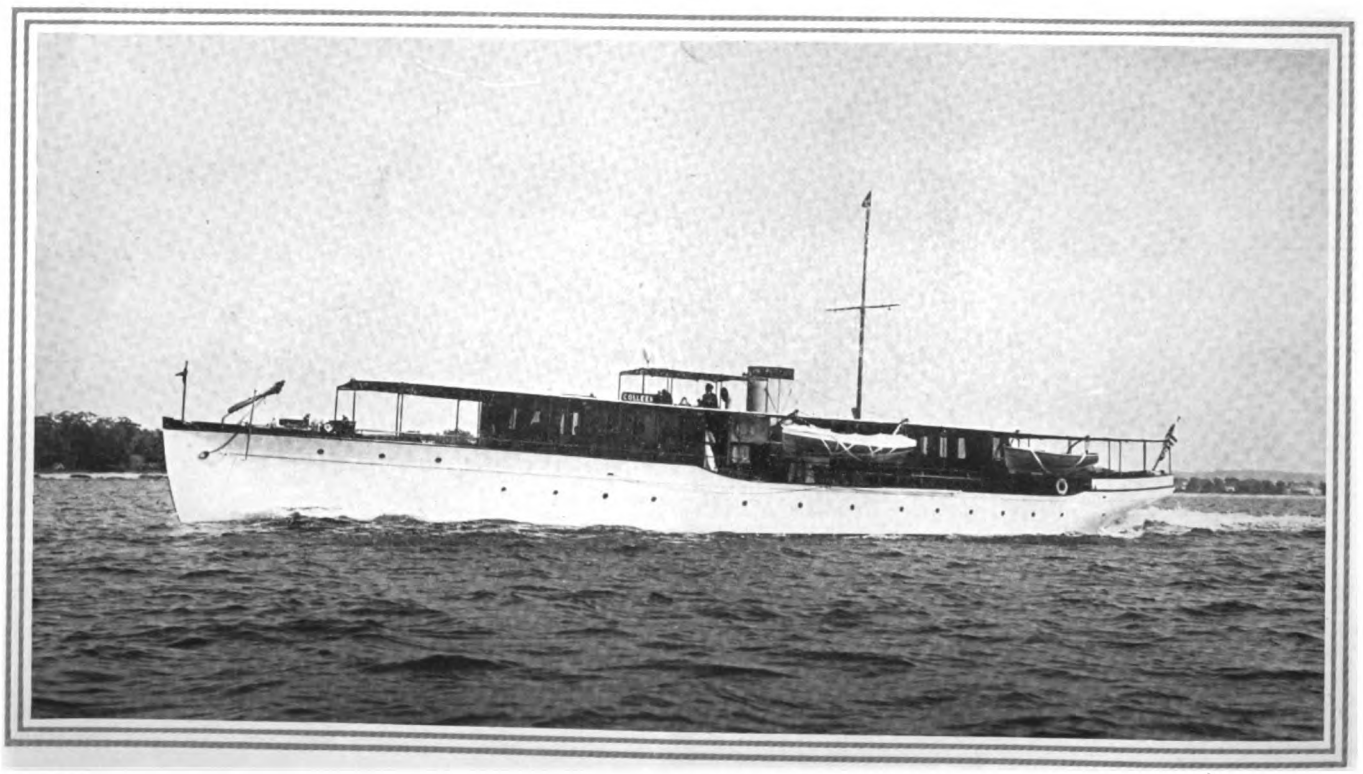
Length:- 110 ft. Beam:- 18ft. 2in. Draft:- 6 ft.

Owner:- Samuel A. Salvage, Port Washington, L. I.

Designer:- B. T. Dobson, New Bedford, Mass.

Builders:- George Lawley & Son Corp., Neponset, Mass.

Power Plant:- A pair of six cylinder Winton Diesel Oil Engines rated at 135 H. P. each, designed and built by the Winton Engine Works, Cleveland, Ohio



WINTON ENGINE WORKS,

***New York City*—A. G. Griese, Inc., 30 Church St.** ***Seattle*—H. W. Starrett, Sunset Engine Co.**
***Washington, D. C.*—R. L. Fryer, 817 Alboe Bldg.**

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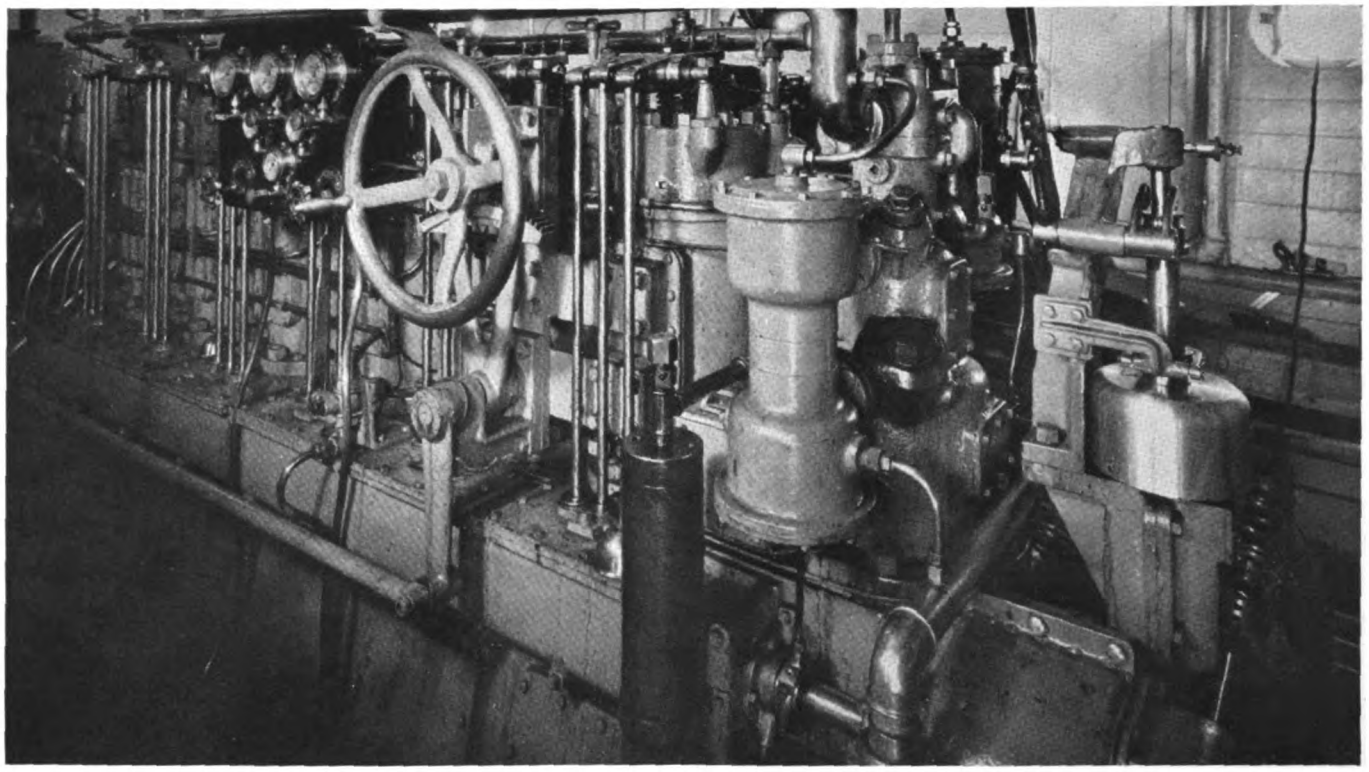
ton ENGINES

The Power and efficiency of the Winton Diesel Type Oil Engine is recognized by marine engineers and discriminating owners the world over.



CLEVELAND, OHIO, U. S. A.

***Los Angeles, Cal.*—F. G. Bryant, 704 Delta Bldg.**

***New Orleans, La.*—A. Baldwin & Company**

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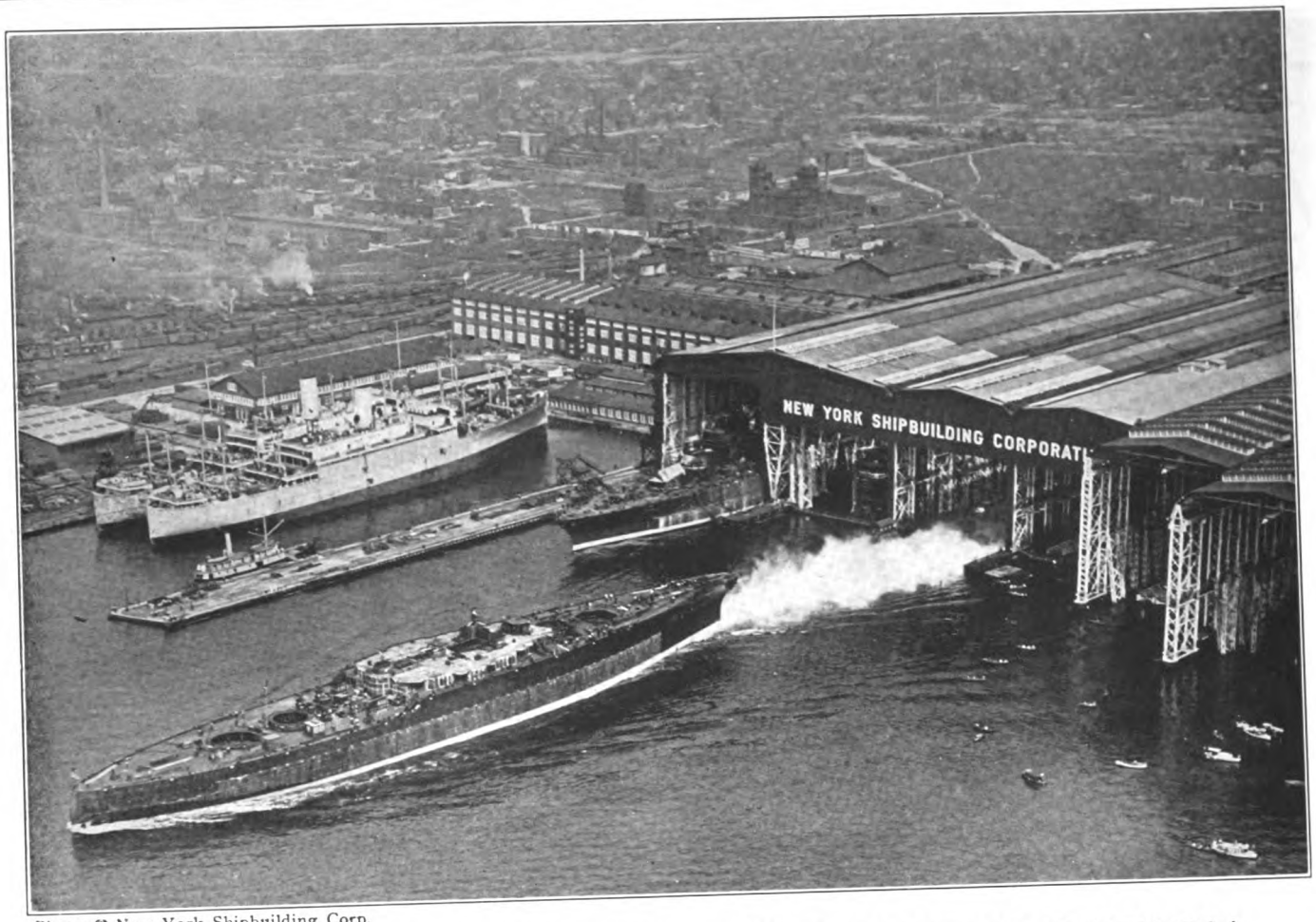

Photo. © New York Shipbuilding Corp.

NEW YORK SHIPBUILDING CORPORATION

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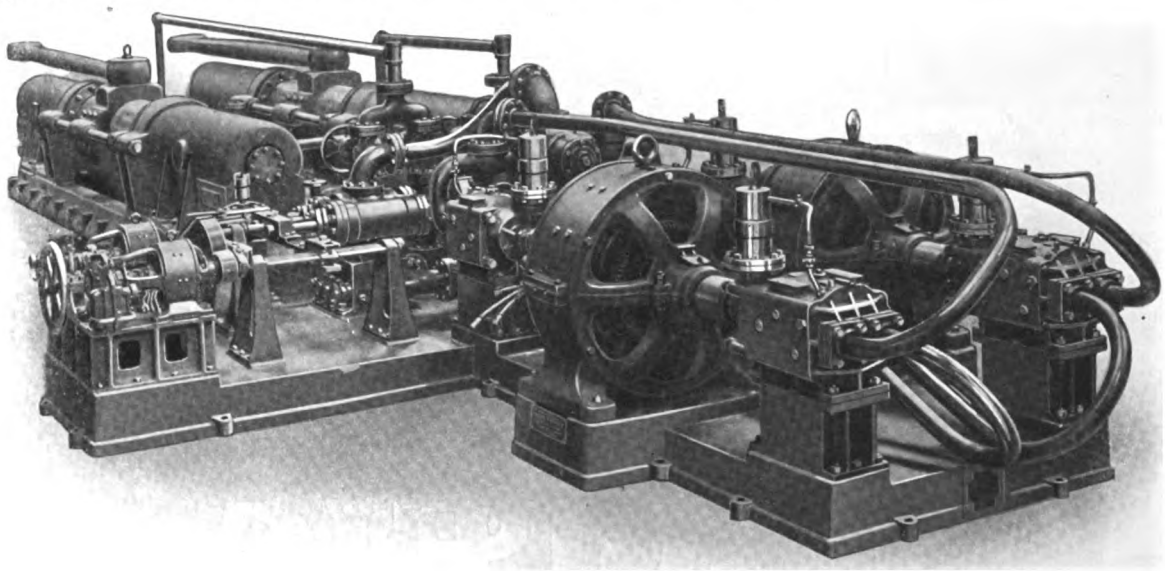
CAMDEN, NEW JERSEY, U. S. A.

HYDE WINDLASS COMPANY - Bath, Maine

High grade marine auxiliary machinery and manganese bronze propellers



"Hydro-Electric Steering gear installed on U. S. Battleship COLORADO"

Hydro-electric Steering-gears, electric-windlasses, electric-winches, electric-capstans for motorships a specialty

When ordering specify "HYDE"

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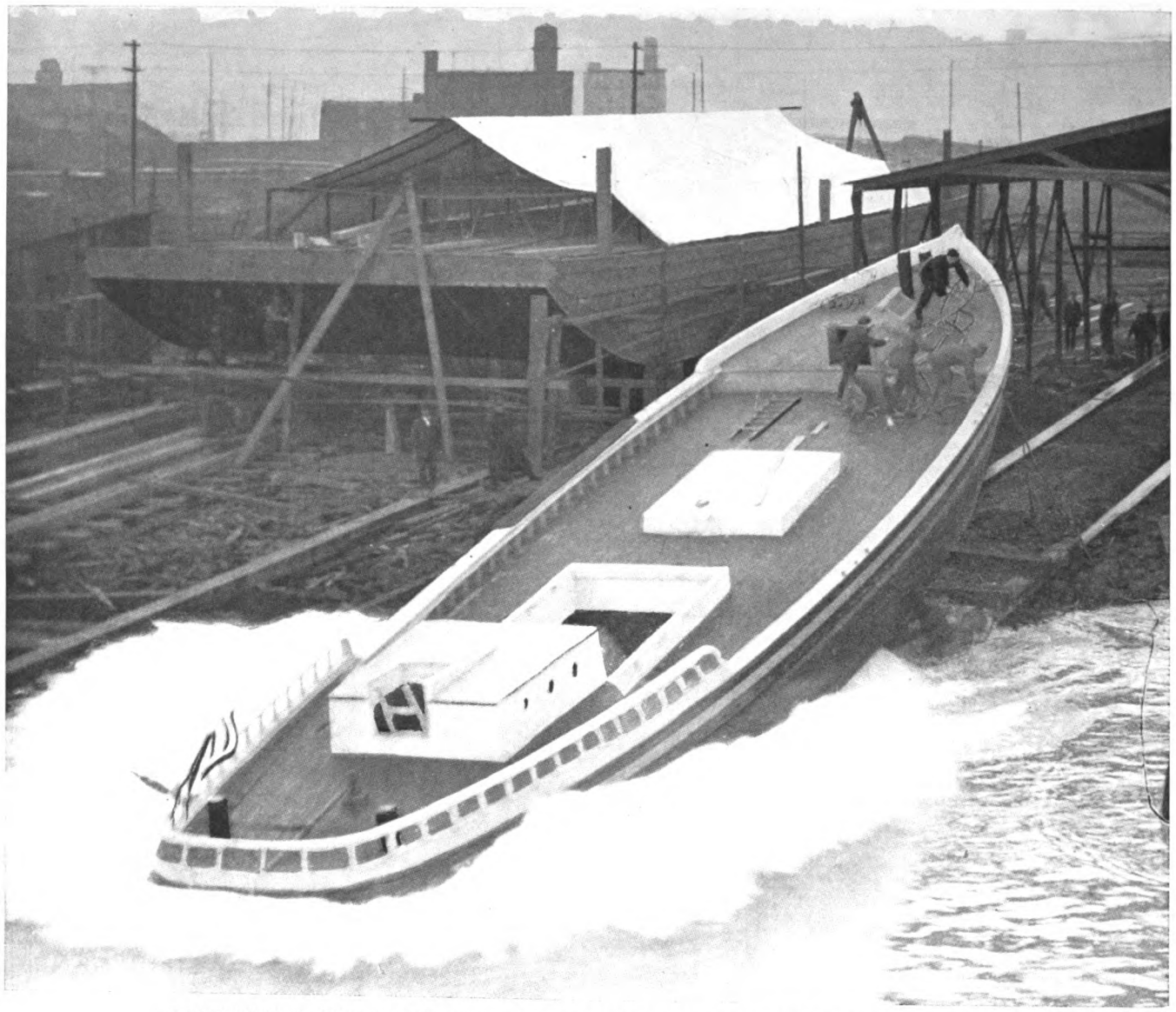
THEY ARE LAUNCHING THEM EVERY DAY ON THE PACIFIC



LAUNCHING A NEW MOTOR HALIBUT SCHOONER FROM A BOAT YARD AT SEATTLE.

NOWHERE else are so many heavy oil engines being installed at the present time as on the Pacific Coast. Almost every day a new or an old boat is launched with either a new Diesel or a Surface Ignition engine. All of the old steam and gasoline plants are being replaced with oil engines. All the new boats are being powered with oil engines. The Pacific Coast is the world's greatest market at present for oil engines ranging in sizes from 15 to 300 h.p.

This field is covered fully, completely and exclusively by "Pacific Motor Boat" which for fourteen years has been the recognized organ of the marine internal combustion engine interests of the Pacific.

Sample copies and advertising rates sent on application

71 Columbia St., **PACIFIC MOTOR BOAT** Seattle, Wash.

"The Magazine that Covers the Pacific"

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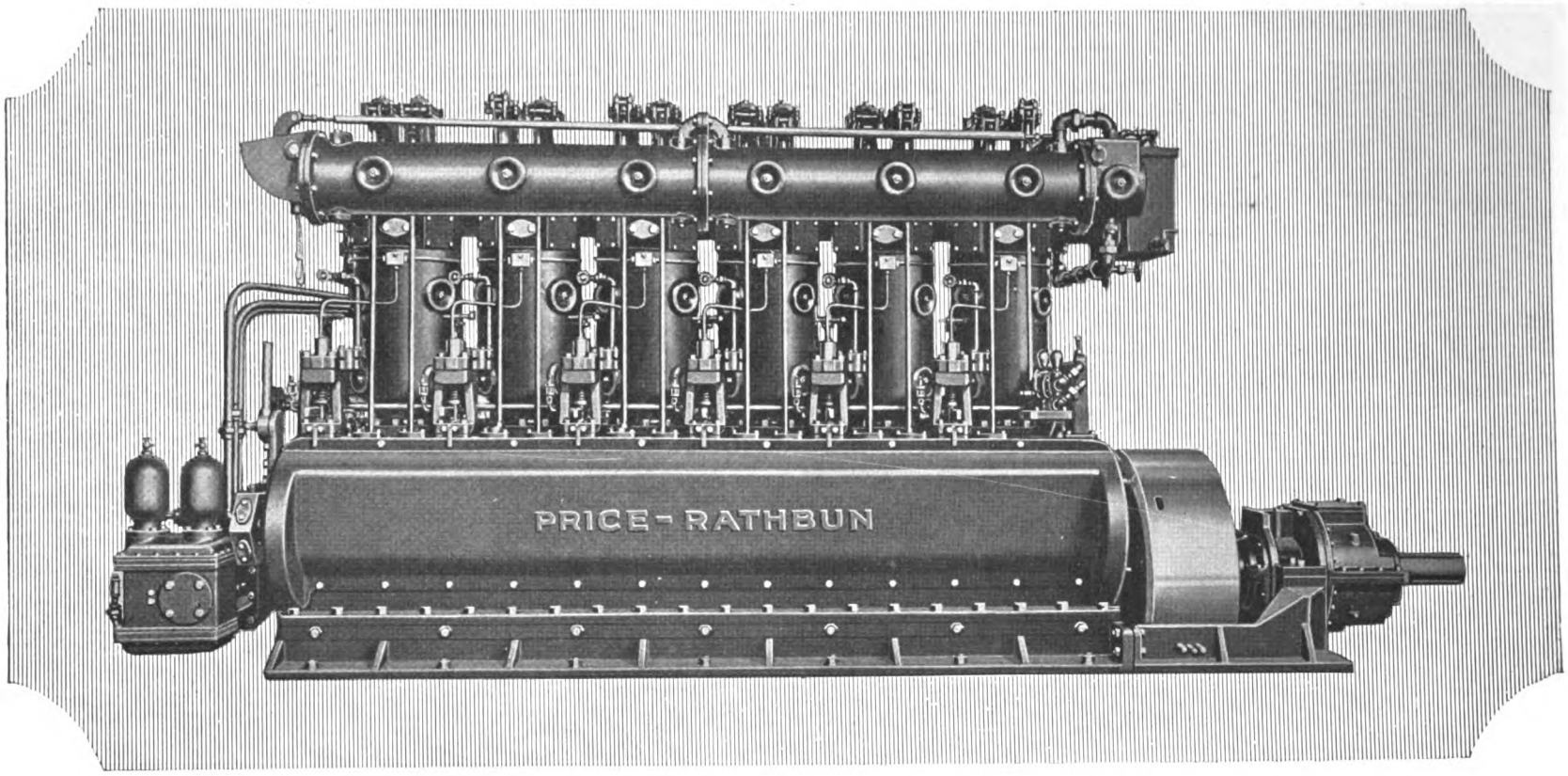

The Advantages of Oil Engine-Electric Drive

for ship propulsion can be fully realized only when the electrical equipment is combined with oil engines possessing the *simplicity* and *high fuel economy* of the

PRICE-RATHBUN ENGINE

A line of sizes ranging from 240 to 750 BHP has been developed which gives the ship operator a wide choice in number and size of engine generator sets. These engines

Are designed for marine installation.

Have six cylinders.

Use the Price system of direct injection of fuel, eliminating the high pressure injection air compressor and thereby reducing the weight and floor space of installation.

Have automatic pressure system of lubrication.

Have a simple yet sensitive governor control which automatically proportions the fuel charge to meet load fluctuations, maintaining the constant speed essential for correct operation of electric generators and motors.

Have moderate weight per horse-power making it possible for total weight of installation to be no greater than for a direct drive installation.

Our engineers will be glad to go into full details with you with reference to marine oil engine electric drive.

INGERSOLL-RAND COMPANY, 11 Broadway, New York

PRICE-RATHBUN Engines are also built for direct drive in sizes from 220 to 750 BHP.

19-MOE

Ingersoll-Rand

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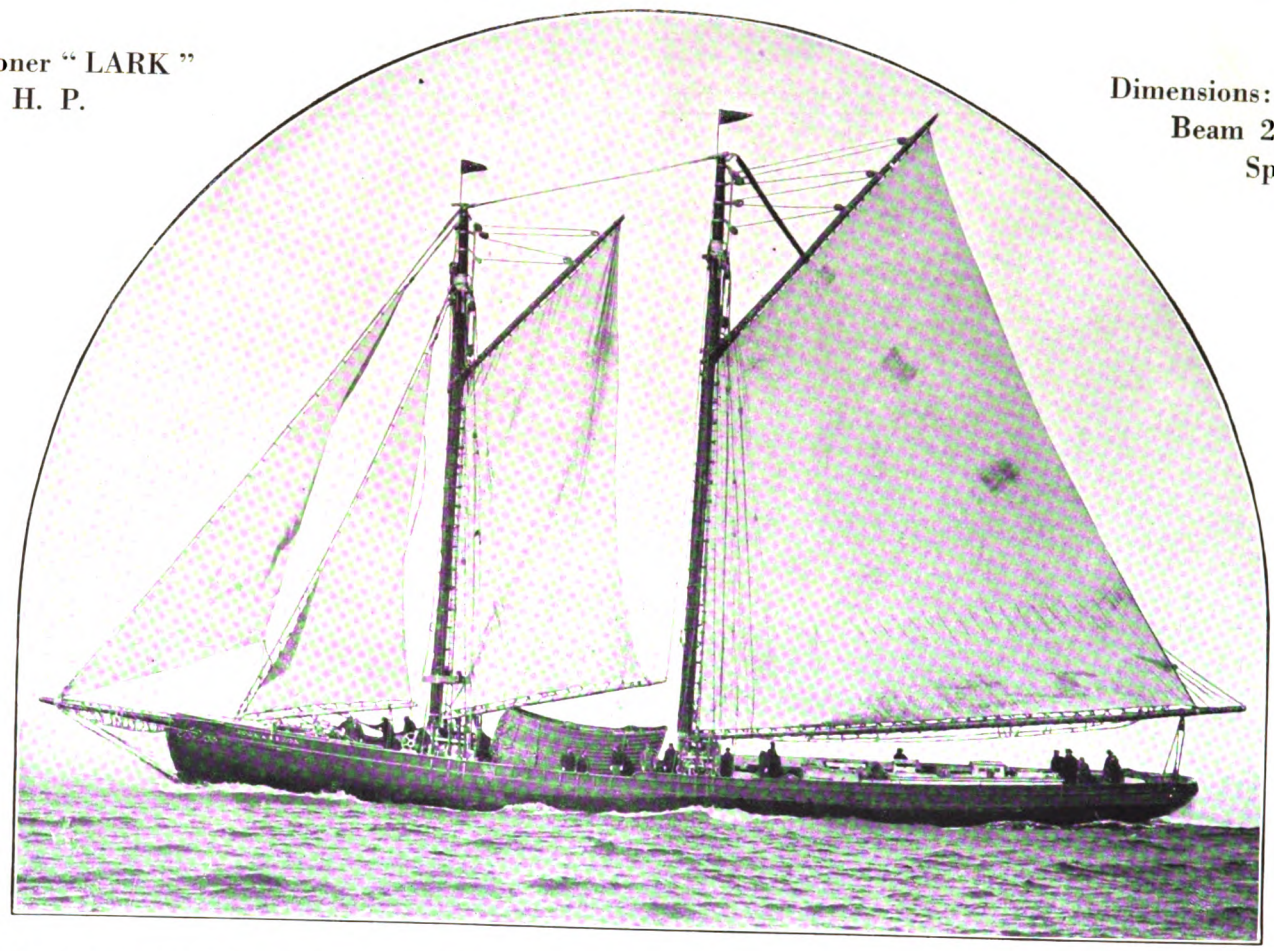
BOLINDERS

Aux. Schooner "LARK"
1—175 B. H. P.
Bolinder

Dimensions: Length 126′
Beam 25′, Draft 13′
Speed, 9 Miles



The "LARK" is the latest addition to the Bolinder engined fishing fleet in the New England States. The owners are O'Hara Bros. of Boston, Mass., and she is their third Bolinder installation, completed during the last twelve months. O'Hara Bros. have had practical experience with most makes of medium sized Semi-Diesel as well as straight Diesel Engines and their decision to use a Bolinder also in this vessel shows their absolute confidence in this make and is another proof of its high qualities.

There is no doubt that the BOLINDER is the logical power plant for fishing vessels, tugs, barges and general work boats. The "LARK" is only one example. There are numerous others —we shall be glad to tell about them.

Write for information.

Sizes from 6 to 500 Brake Horse Power

BOLINDERS COMPANY, Inc., 30 Church St., New York City

BOLINDERS COMPANY, 411 Exchange Building, 53 State Street, BOSTON, MASS.

COMPAÑIA BOLINDER
Avenida de Mayo 560
BUENOS AIRES, ARGENTINA

ROBINSON & HAIGH
Mercaderes 10
HAVANA, CUBA

CARIB TRADING CO.
CARTAGENA, COLOMBIA

FIDANQUE BROS. & SONS
PANAMA, REP. OF PANAMA

HENRY LUND & CO.
Marine Building
SAN FRANCISCO, CAL.

LAMMERS & MAASE, LIMITED
170 McGill Street
MONTREAL, CANADA

ALEXANDER McDOUGALL
ST. JOHN'S, NEWFOUNDLAND

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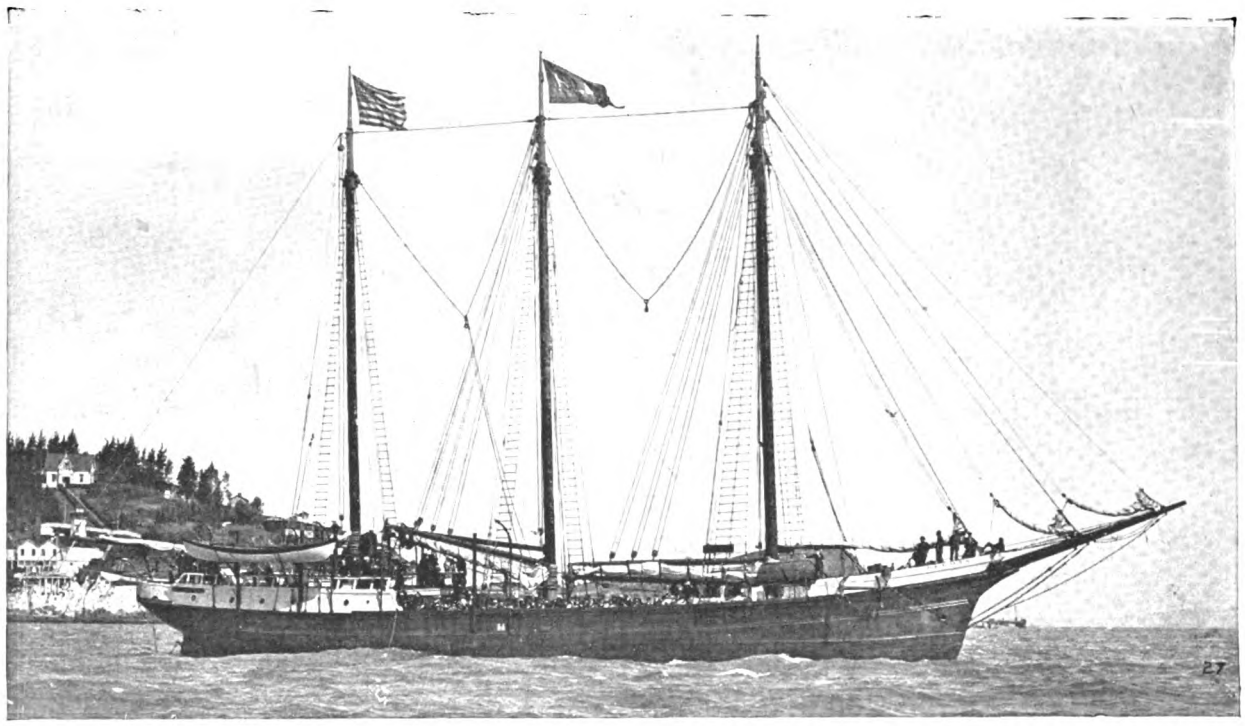
ATLAS-IMPERIAL DIESELS



THE FAMOUS ARCTIC TRADING SCHOONER "HERMAN," OWNED BY H. LIEBES & CO., OF SAN FRANCISCO

THIS vessel, powered with a 250 h. p. Atlas-Imperial Diesel engine, completed during the past summer one of the most remarkable trips ever made by a motor vessel of any kind. The story of her achievement and of her engine's unusual performance is told in the following letter:

H. LIEBES & COMPANY
Established 1864

Telephone Garfield 2460

Manufacturing Furriers
Women's and Misses' Apparel and Accessories
Grant Ave. at Post Street
San Francisco

Portland
New York

October 11th, 1922.

Mr. A. Warenskjold,
Care Atlas Imperial Engine Co.,
Oakland, California.

Dear Mr. Warenskjold:

I phoned to you the other day, but you were not there, as I wanted to tell you that we received a wire from Captain Pederson from Nome, after he had made a trip to Point Barrow and to the eastward. The Captain, in his wire, made the following mention regarding the engine:

"Our engine is certainly a wonder, we steam all the time, and have sufficient fuel left for next year."

I know you will be glad to hear this news, especially in view of the fact that the ice conditions in the Arctic this year were, by far, the worst that any of our Captains remember encountering in 20 years' experience in the Arctic, which means that there was a great deal of forwarding and backing in the ice, as well as an unusual amount of blasting to get the ship through, so all in all this year's test was considerably more severe than any preceding year, and had it not been for the reliable performance of the engine, without a doubt the Captain would have been caught in the ice, and compelled to winter in the Arctic.

The news that they have sufficient fuel for next year undoubtedly proves that the engine is more economical than we even expected.

The Captain has left Unalaska for home, and we look for his arrival here within the next 12 days, at which time you will undoubtedly have an opportunity of speaking to him personally and inspecting the engine yourself.

Trust that business conditions with you are satisfactory, and with kindest regards, I am

Sincerely yours,

ARNOLD LIEBES.

THE CRUISE OF THE "HERMAN" INTO THE ARCTIC THIS YEAR HAS PROVEN INDISPUTABLY THE SUCCESS, RELIABILITY AND ECONOMY OF THE ATLAS-IMPERIAL DIESEL ENGINE UNDER THE MOST TRYING CONDITIONS

The Atlas-Imperial is an original Mechanical Injection Full Diesel Engine
When better Diesels are shown they will bear the name ATLAS-IMPERIAL

REPRESENTATIVES

Seattle, Wash., Atlas Gas Engine Agency, 901 Western Ave.
Astoria, Ore., Atlas Imperial Engine Agency.
Honolulu, T. H., H. A. Peterson, Box 155.
Juneau, Alaska, Charles G. Warner Co.
New Orleans, La., J. G. Davis, 1324 Music St.
Nome, Alaska, Alaska Lighterage & Commercial Co.
Papeete, Tahiti, Et. Davio.
San Pedro, Calif., Garbutt & Walsh.
Suva, Fiji, Morris Hedstrom, Ltd.
Vancouver, B. C., Ferrier & Lucas.
San Diego, Cal., West Coast Gas Engine Co.

ATLAS-IMPERIAL ENGINE CO., Oakland, California, U. S. A.

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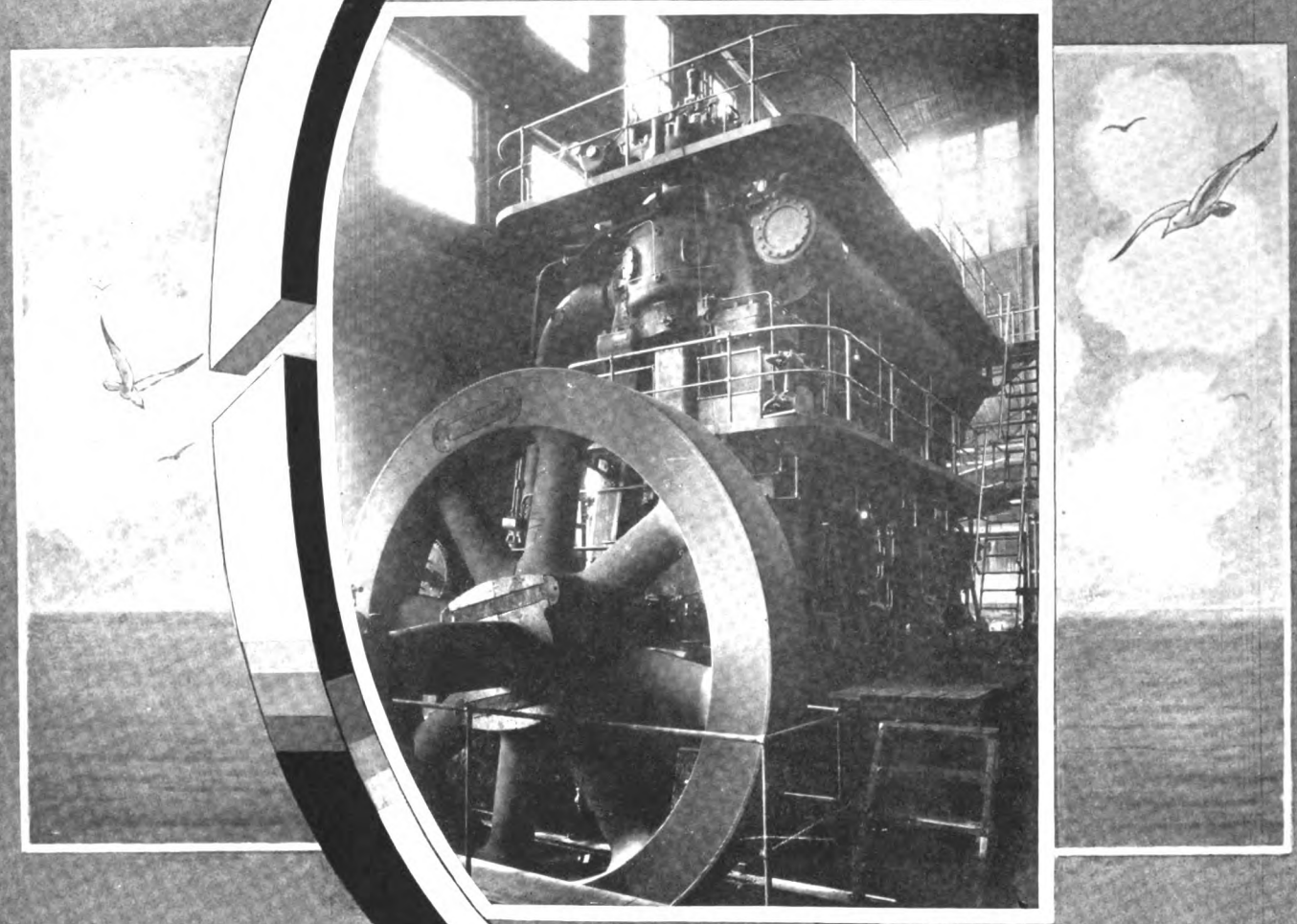
QUALITY SNAP RINGS

Showing Nordberg Diesel Engine equipped with Quality Snap Rings.

"More Than a Million a Month"



THE Piston RING COMPANY

MUSKEGON, MICH.

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G-E Electric Auxiliary Equipment

For your requirements:

G-E Turbine-Electric Drive
G-E Electric Drive for Motorships
G-E Marine-Geared Turbines
G-E Electric Drive for Auxiliaries

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in all large cities

30-35

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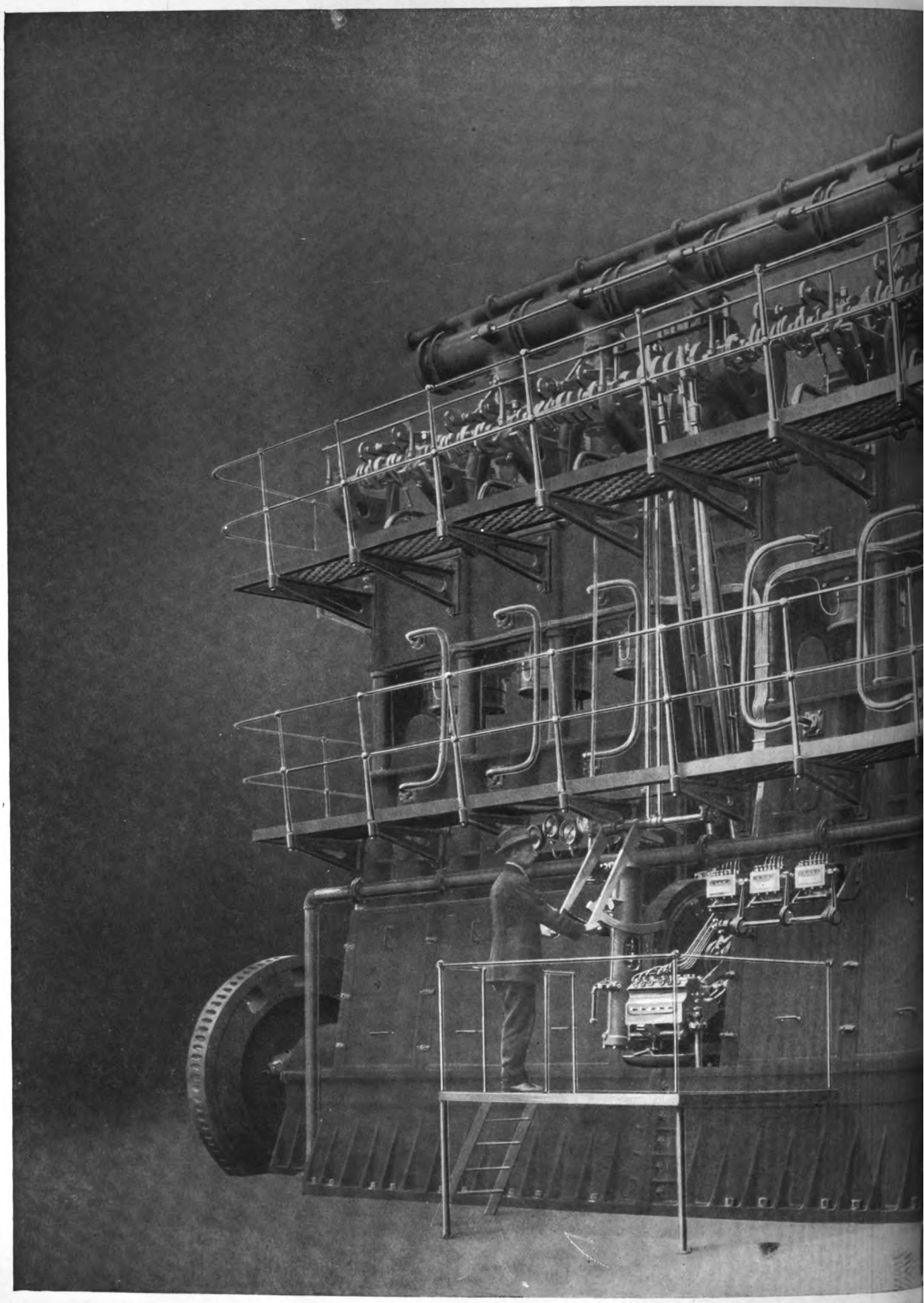
WERKSPOOR

E C O N O M Y



ONE OF THE 850 BHP WERKSPOOR MARINE DIESEL ENGINES INST

PACIFIC DIESEL

OAKLAND,

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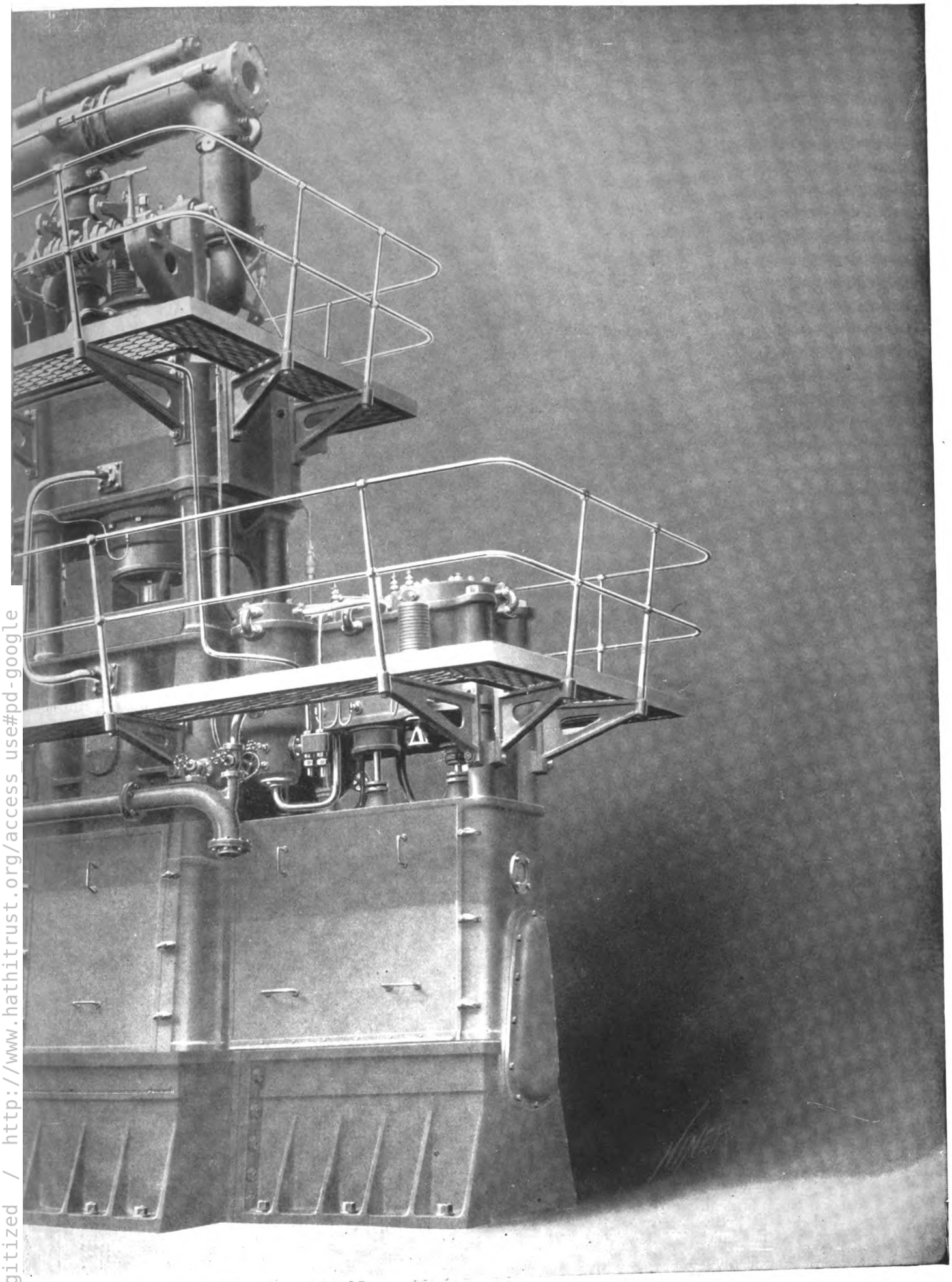
IESEL ENGINES



D IN THE STANDARD OIL CO.'S MOTOR-TANKER "H. T. HARPER."

RELIABILITY

NGINE COMPANY

ALIFORNIA

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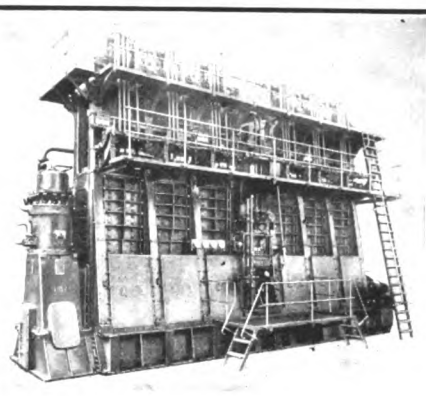
BURMEISTER & WAIN, LIMITED

SINGLE SCREW MOTOR SHIP "LEISE MÆRSK"

ENGINEERS & SHIPBUILDERS

COPENHAGEN, DENMARK

THE LONG STROKE SLOW RUNNING ENGINE INSTALLED IN THE M/S *"LEISE MÆRSK"*



THIS TYPE OF ENGINE IS ESPECIALLY ADAPTABLE FOR SINGLE SCREW CONVERSION JOBS

UP TO JUNE, 1922 PUT IN ACTUAL SERVICE **91** MOTORSHIPS WITH ENGINES OF THE B & W TYPE TOTALLING **1,108,934** TONS DISPLACEMENT

NAME OF VESSEL	Loaded Displ.
ABA	14660
AFRIKA	19000
AMERICA	10660
ANNAM	14000
ARATOR	10400
ASIA	15000
AUSTRALIEN	14100
BALBOA	13500
BALZAC	2250
BATAVIA	2250
BAYARD	8430
BINTANG	5100
BONHEUR	15000
BORGLAND	10660
BRAZIL	6755
BUENOS-AIRES	13500
BULLAREN	13500
CALIFORNIA	12100
CANADA	13500
CANTON	14400
CHILE	14450
COLUMBIA	14450
COMETA	9780
DINTELDIJK	19100
DORSETSHIRE	15500
ELMAREN	13500
FALSTRIA	11000
FIONIA	10800
FORMOSA	15000
FRITIOF	1000
FRITZOE	1484

NAME OF VESSEL	Loaded Displ.
FRATELLI BANDIERA	10525
GEORGE WASHINGTON	15000
GLENADE	13640
GLENAMOY	13800
GLENAPP	19100
GLENARIFFE	13640
GLENARTNEY	13800
GLENAVY	11000
GLENBEG	19100
GLENGARRY	19100
GLENGYLE	13400
GLENLUCE	13640
GLENOGLE	19100
GLENTARA	13640
HEMLAND	11500
INDIEN	12180
JAVA	19000
JULIUS SCHINDLER	6200
KANGAROO	11000
KEDOE	9800
KRONPRINSESSAN MARGARETA	9700
KRONPRINS GUSTAF ADOLF	9700
KOBENHAVN	7900
LA PAZ	13640
LAPONIA	11700
LEIGHTON	15200
LEISE MÆRSK	6350
LIMA	9700
LINNELL	15200
LOBOS	13600
LOCHKATRINE	19100

NAME OF VESSEL	Loaded Displ.
LOSADA	13600
LOUISIANA	13858
MALAKKA	14100
MALAYA	19000
MISSISSIPPI	11177
OREGON	12360
OSSAG	6200
PACIFIC	9700
PANAMA	14100
PEDRO CHRISTOPHERSEN	9700
PERU	14450
POLARHAVET	10585
SAN FRANCISCO	9700
SELANDIA	10525
SIAM	14000
SOMERSETSHIRE	15780
SONGDAL	7300
SONGVAND	7300
SONGVARD	7300
STRASSA	11700
STUREHOLM	11100
SUECIA	9700
SULINA	6400
TENERIFFA	15025
THEODORE ROOSEVELT	15100
TISNAREN	13500
TONKING	14100
VALPARAISO	9700
WILLIAM PENN	17100

U. S. LICENSEE
THE WM. CRAMP & SONS CO.
PHILADELPHIA, PA., U. S. A.

U. S. REPRESENTATIVE for B. & W.
H. C. HALLINGS
27 WHITEHALL STREET, NEW YORK

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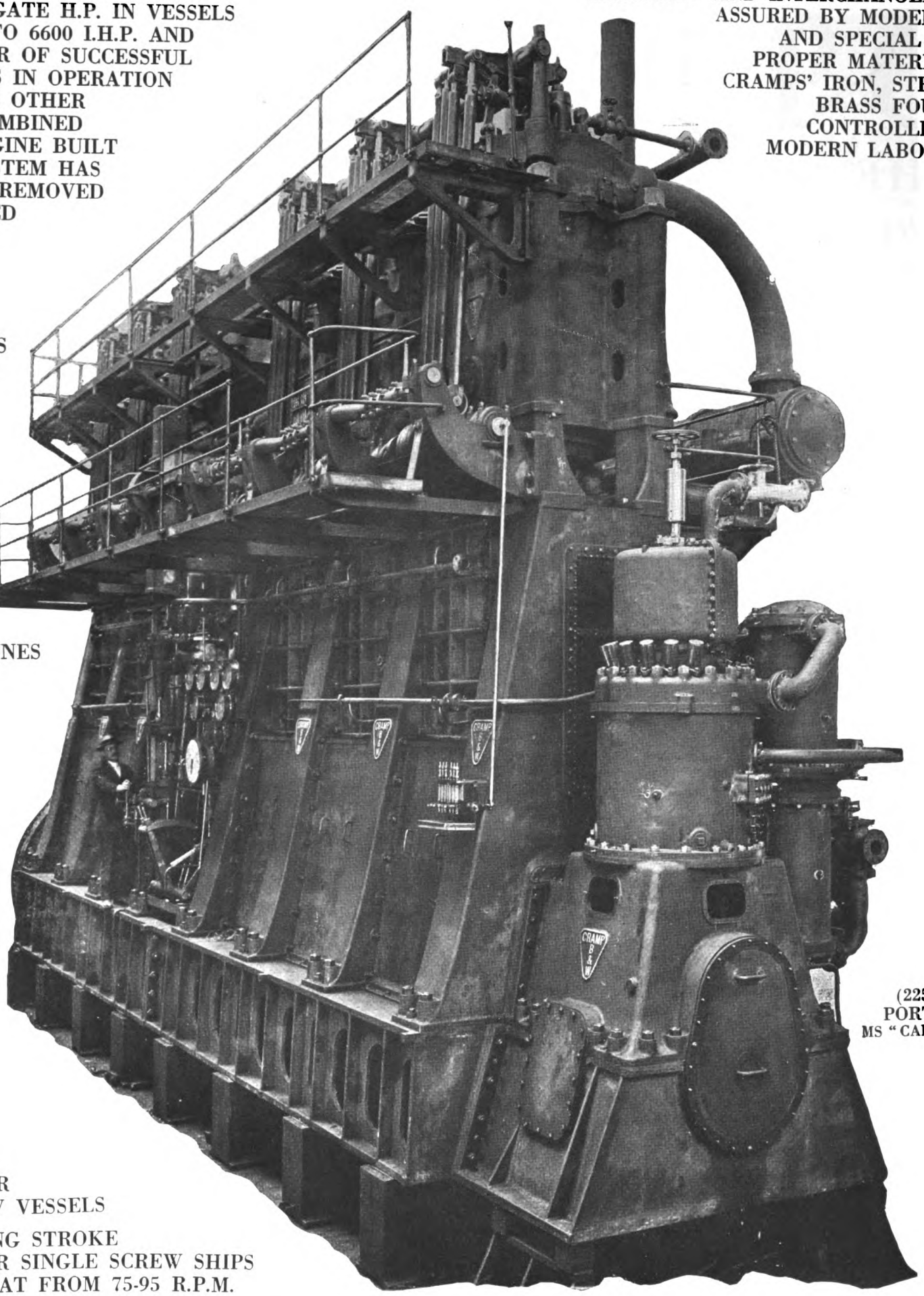
UNDER THE B. & W. SYSTEM
THE AGGREGATE H.P. IN VESSELS
FROM 1500 TO 6600 I.H.P. AND
THE NUMBER OF SUCCESSFUL
MOTORSHIPS IN OPERATION
EXCEED ALL OTHER
SYSTEMS COMBINED
AND NO ENGINE BUILT
TO THIS SYSTEM HAS
EVER BEEN REMOVED
OR REPLACED

ACCURACY AND INTERCHANGEABILITY
ASSURED BY MODERN JIGS
AND SPECIAL TOOLS;
PROPER MATERIALS BY
CRAMPS' IRON, STEEL AND
BRASS FOUNDRIES
CONTROLLED BY A
MODERN LABORATORY

MOTORSHIPS
THAT STAY
ON THE
SEAS

DIESEL ENGINES
THAT STAY
IN THE
SHIPS



(2250 I.H.P.)
PORT ENGINE
MS "CALIFORNIAN"

STANDARD
ENGINES FOR
TWIN SCREW VESSELS

SPECIAL LONG STROKE
ENGINES FOR SINGLE SCREW SHIPS
OPERATING AT FROM 75-95 R.P.M.

THE WM. CRAMP & SONS S. & E. BLDG. CO.

PHILADELPHIA, PA., U. S. A.

BUILDERS OF COMPLETE MOTORSHIPS TO ONE STANDARD OF
WORKMANSHIP AND ONE GUARANTEE FOR PERFORMANCE
(Burmeister & Wain System)

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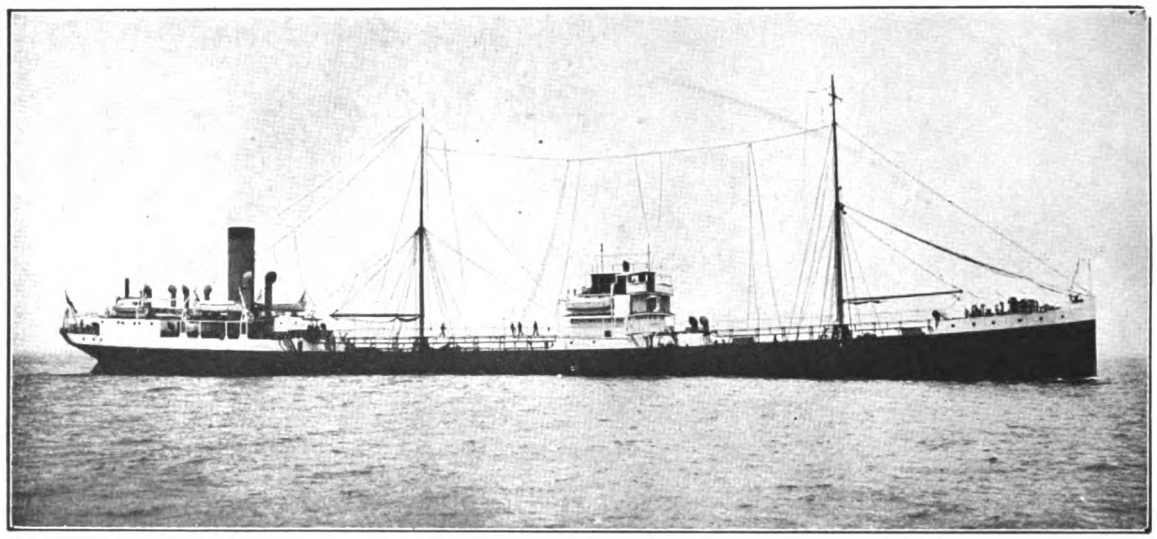
OIL FUEL

THE FUEL OF THE 20th CENTURY

Efficiency ***Economy*** ***Cleanliness***



One of our Fleet of Oil-carrying Ships.

The Asiatic Petroleum Co., Ltd.

ST. HELEN'S COURT, GREAT ST. HELEN'S, LONDON, E. C. 3,

CAN ARRANGE SUPPLIES OF

OIL FUEL FOR MOTORSHIPS, STEAMERS' BUNKERS and INDUSTRIAL PURPOSES at

Adelaide
Alexandria
Amsterdam
Antwerp
Aomori
Avonmouth
Balboa (Panama Canal)
Balik Pappan
Bangkok
Barcelona
Barrow
Barton (Manchester Ship Canal)
Batavia
Bilbao
Boelebaai Ceram
Bombay
Buenos Ayres
Calcutta
Canton
Cape Town
Cebu
Christiania (Soon)
Colombo
Colon (Panama Canal)
Copenhagen
Curacao
Gemsah
Glasgow
Gothenburg
Granton
Hamburg
Hankow
Havana
Hong Kong
Hull
Hurghada
Iquique
Jarrow-on-Tyne
Karachi
La Guayra (Venezuela)
Las Palmas
Leghorn
Liverpool
Lisbon
London (Shell H'ven & Thames Haven)
Macassar
Madras
Malmo
Malta
Manila
Maracaibo (Venezuela)
Marseilles
Melbourne
Miri
Mombasa
Montevideo
Montreal
Nagasaki
New Orleans
New York
Palembang
Palermo
Pangkalan Berandan
Penang
Perim
Pernambuco
Piraeus
Portland (Oregon)
Port Said
Port Sudan
Pulo Bukom
Puloe Samboe
Rotterdam
Rouen
Rio de Janeiro
Sabang
Saigon
Saitozaki
Salina Cruz (Pacific)
San Francisco
San Pedro
Santos
Seattle (Washington)
Shanghai
Singapore
Sourabaya
Southampton
Stöckholm
Suez
Sydney
Svolvaer
Tampico
Tarakan
Trieste
Trinidad
Tuxpan
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Venice
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And New Stations are expected to be ready shortly at

Antofagasta
Constantinople
Durban
Havre
Port St. Louis du Rhone
San Juan (Porto Rico)
St. Vincent

BUYERS desiring information regarding supplies of and price for **Oil Fuel** for use in Internal-combustion Engines or for other purposes should apply to **The Asiatic Petroleum Company, Limited,** at the above address.

THE Asiatic Petroleum Company also supply **Kerosene Oil** for use in the smaller Internal-combustion Engines and are prepared to supply **Petroleum Spirits, Lubricating Oils, Wax** and **Greases** in all Far Eastern Markets.

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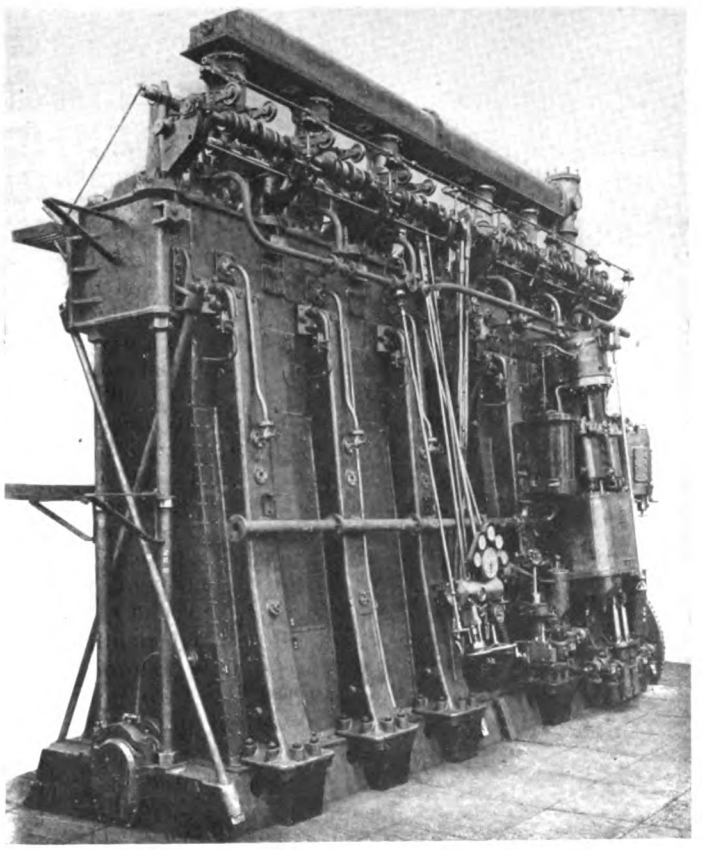
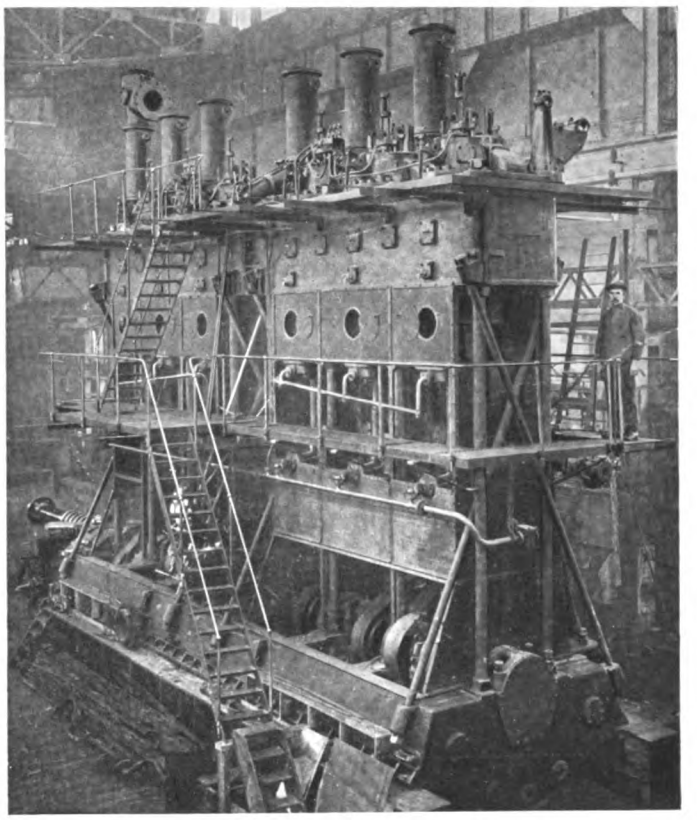
WERKSPOOR

MARINE DIESEL ENGINES

THE FIRST FULL-POWERED OCEAN-GOING MOTORSHIP
WAS DRIVEN BY WERKSPOOR DIESEL OIL-ENGINES



1100 B. H P. WERKSPOOR
MARINE DIESEL ENGINE



DURING CONSTRUCTION OF A 1600 B. H. P.
MARINE DIESEL ENGINE

SIMPLICITY—ACCESSIBILITY—RELIABILITY

50 MOTORSHIPS IN SERVICE AND ON ORDER **50**

AMERICAN LICENSEES

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO.
NEW YORK SHIPBUILDING CORPORATION
PACIFIC DIESEL ENGINE COMPANY

REPRESENTATIVE FOR
U. S. A. AND CANADA:

WILLIAM BRAAT

WOOLWORTH BUILDING
NEW YORK CITY

AMSTERDAM

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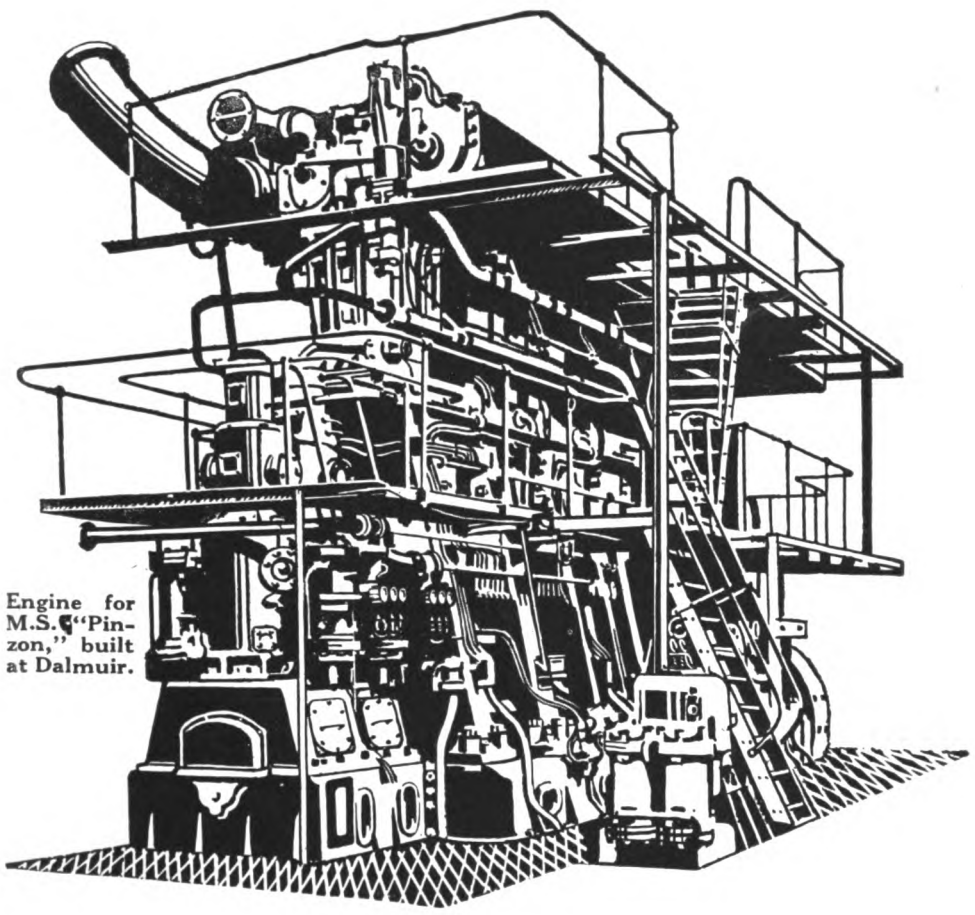
BEARDMORE-TOSI DIESEL *Marine Engine*

THE ENGINE THAT REPRESENTS THE GREATEST ADVANCE IN DESIGN AND IN MARINE PROPULSION



Engine for M.S. "Pinzon," built at Dalmuir.

Results of 100 Hours' Trial.

Average B.H.P.	1,276
Mechanical efficiency, per cent.	77
Average I.H.P.	1,646
Revolutions per minute	124
Mean pressure on B.H.P. basis, lb. per square inch	75.5
Fuel consumption, lb. per P.H.P. per hour	.42
Lubricating oil consumption, total for cylinders and loss, gallons per twenty-four hours	4.5
Exhaust temperature, average at exit from exhaust valve, deg. Fah.	550
Lubricating oil pressure, lb. per square inch	10-12
Circulating water pressure (jacket), lb. per square inch	10-15
Piston cooling water pressure, lb. per square inch	20-30
Water temperature at outlet from cylinder heads, deg. Fah., average.	125
Piston cooling water, outlet temperature, deg. Fah., average	130
Blast air pressure, lb. per square inch	1,000

Extract from THE ENGINEER, November 11th, 1921.

"One of the remarkable features of the trial was the ease with which the engine reversed from full ahead to full astern in seven to eight seconds and accelerated from a minimum speed of 28 revolutions per minute or retarded to a maximum speed of 130 revolutions per minute, without the slightest tremor or vibration."

Full particulars from the builders—

WILLIAM BEARDMORE AND COMPANY LIMITED

NAVAL CONSTRUCTION WORKS: DALMUIR, SCOTLAND.
LONDON OFFICE: 36 VICTORIA ST. S.W.1.

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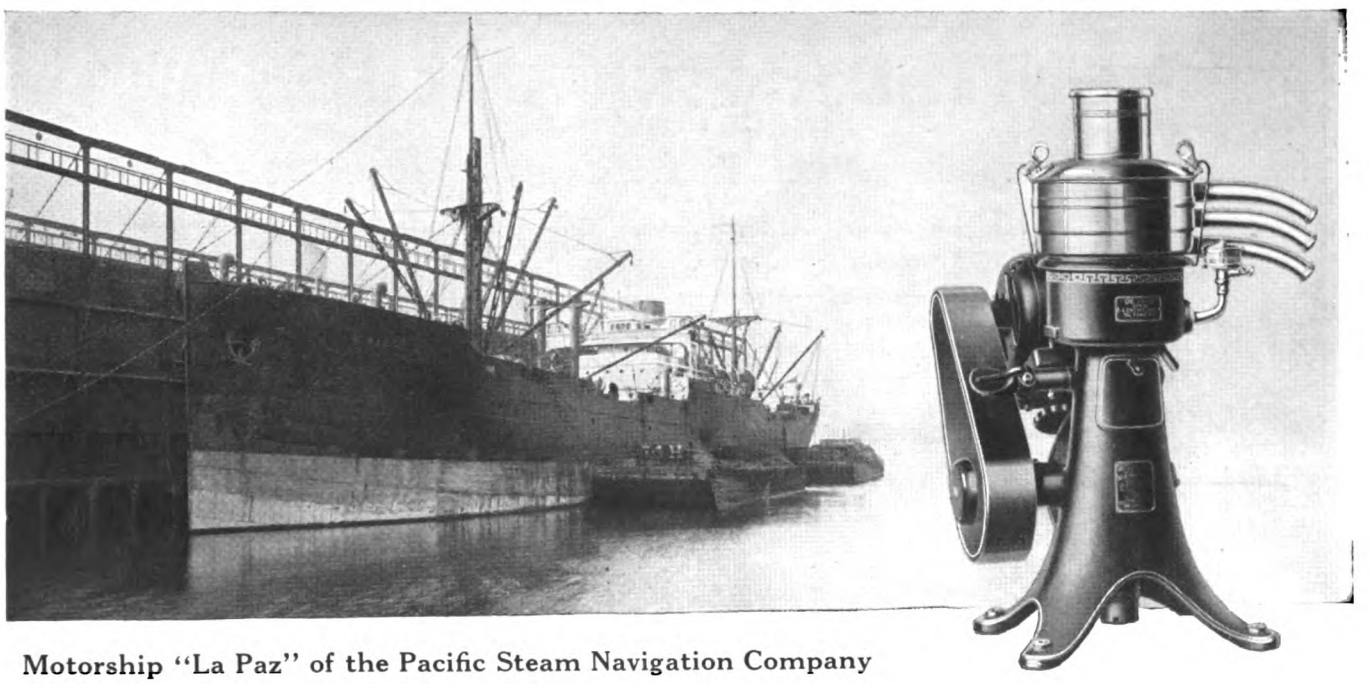

Motorship "La Paz" of the Pacific Steam Navigation Company

De Laval Oil Purifier is saving oil and protecting engines of motorship "La Paz"

The motorship fleet of the Pacific Steam Navigation Company was planned to transport cargo at the lowest possible cost per ton mile. Few, if any, items of design or equipment which contribute to a lower operating cost for the motorship were overlooked.

On each of these motorships, as on many others, a De Laval Oil Purifier has been installed. With this machine, sludge is centrifuged out of the crank-case oil almost as fast as it is formed. As a result bearing wear is greatly reduced and the engines will, without a doubt, give more years of service with less expense for maintenance and overhauling.

By constantly removing impurities from lubricating oil, the De Laval Purifier also effects a great reduction in lubricating costs. The same oil is kept in the system indefinitely, the only replacement being that required to make up for losses by decomposition, evaporation and leakage. No oil need ever be taken out of the system.

No wonder that the Harland & Wolff Shipbuilding Company, builders of the "La Paz" and other vessels of the Pacific Steam Navigation Company's fleet, have in the past two years installed 47 De Laval Purifiers on various vessels building in their yards. The records of other British and American yards also show that De Lavals are now considered as necessary auxiliaries in the engine room of the Diesel or turbine-driven ship.

Mail the coupon for further information regarding ships of either class.

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Please send Bulletins telling how the operation of ships' engines can be improved and lower lubricating costs obtained, with particular reference to the type of engine checked.

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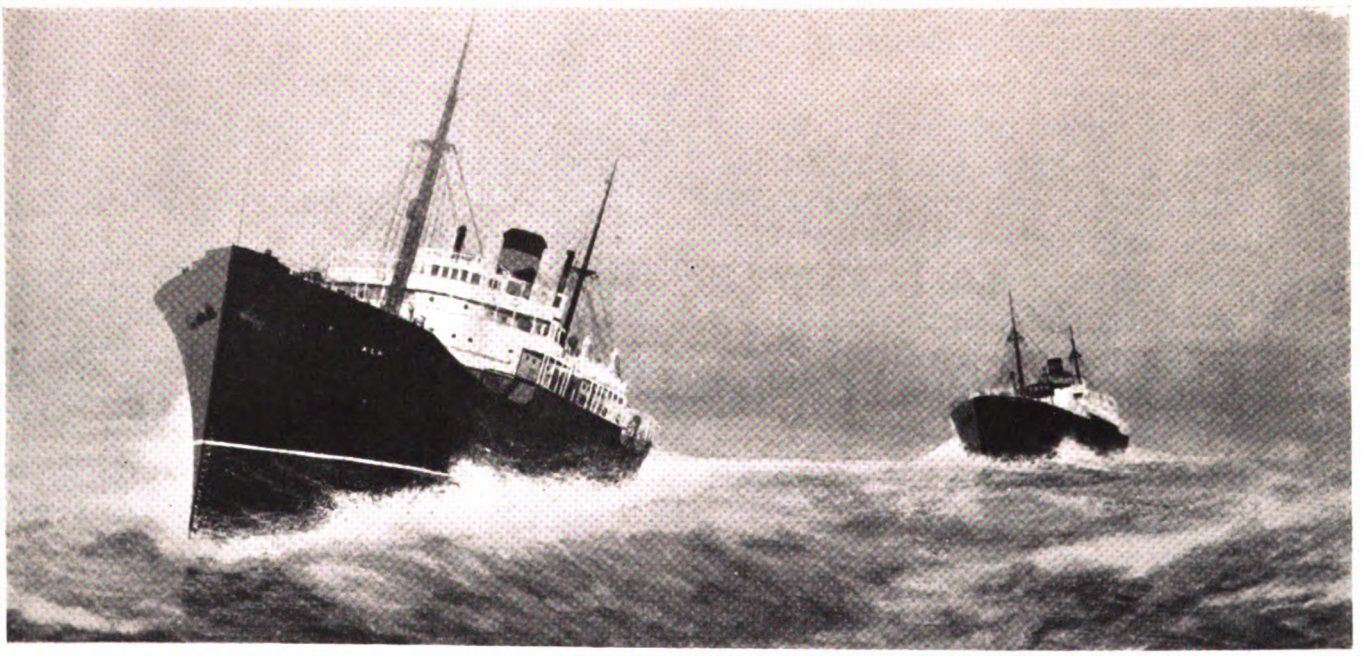

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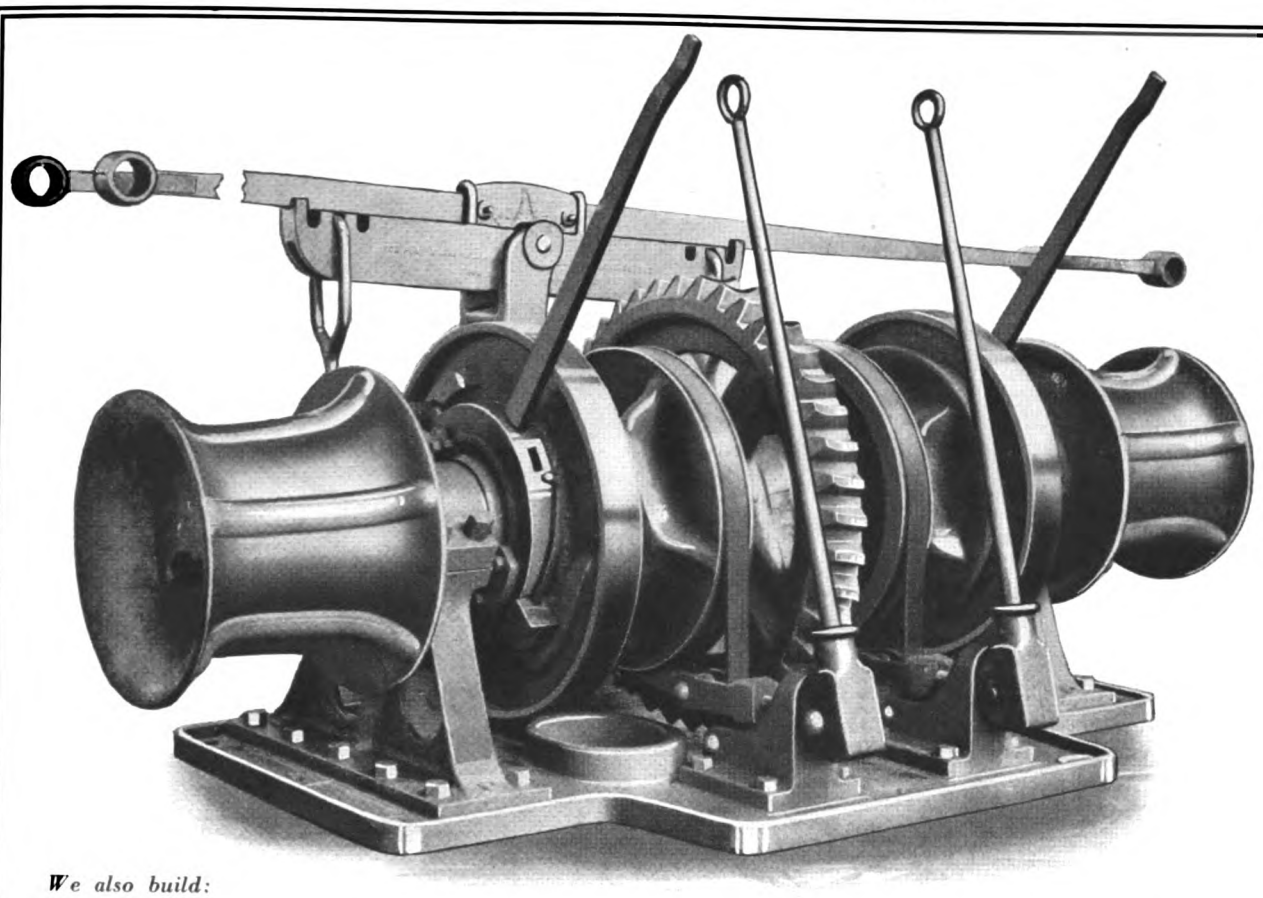

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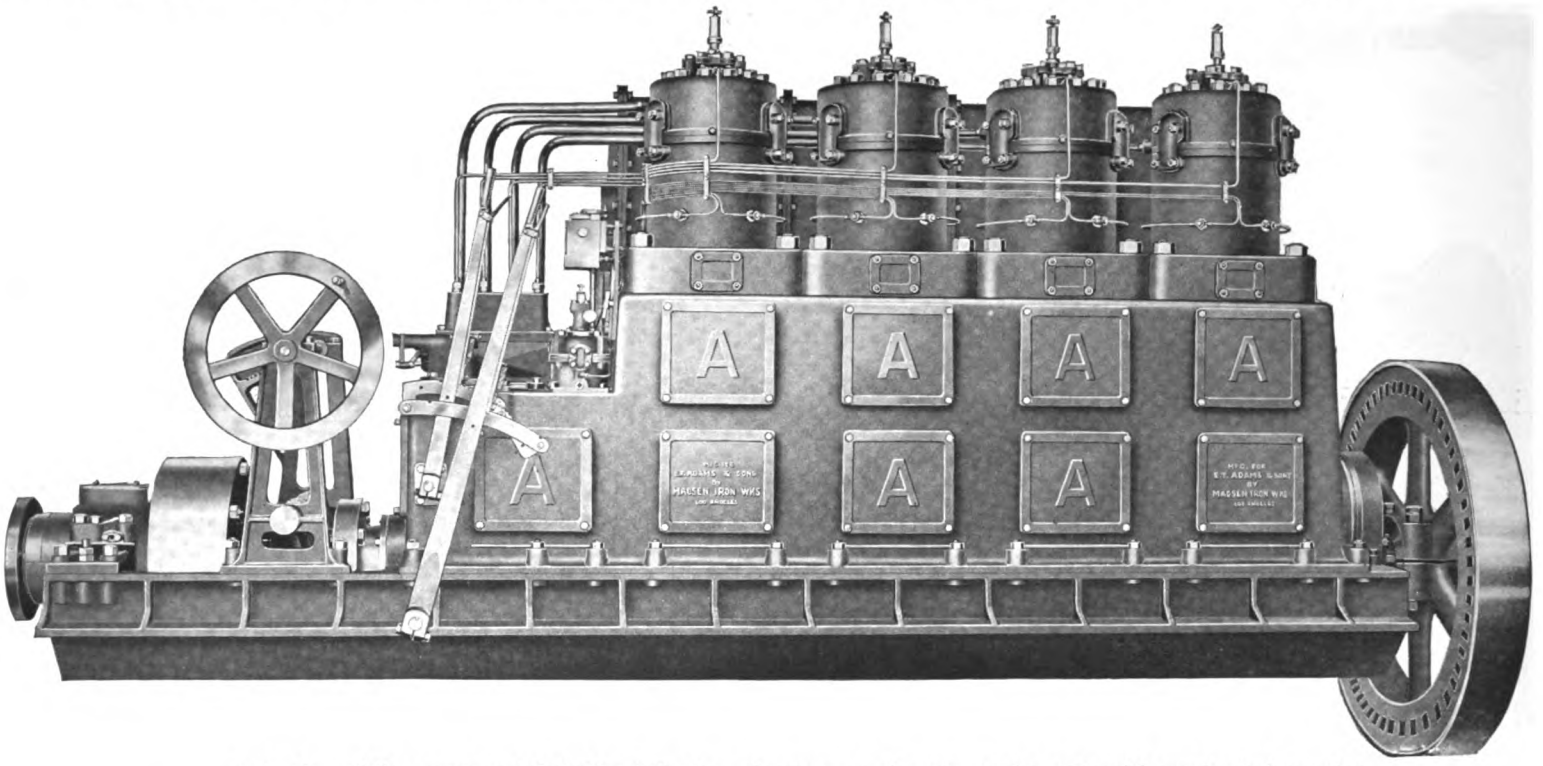
The Adams Diesel Engine



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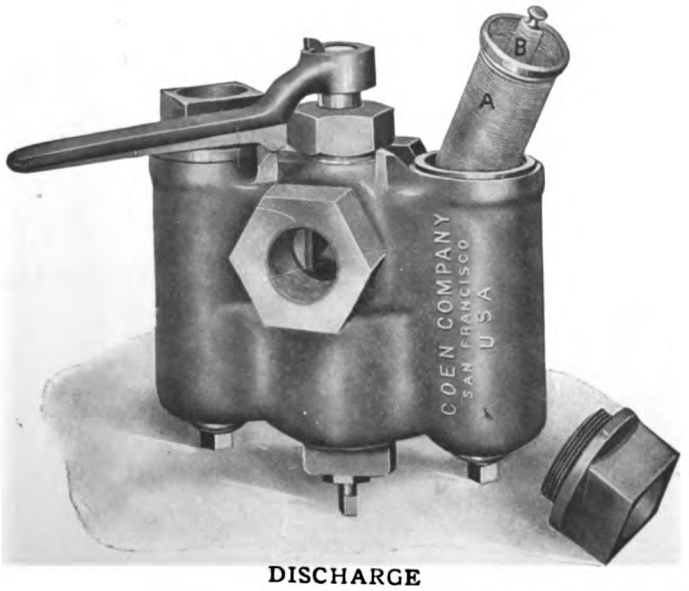

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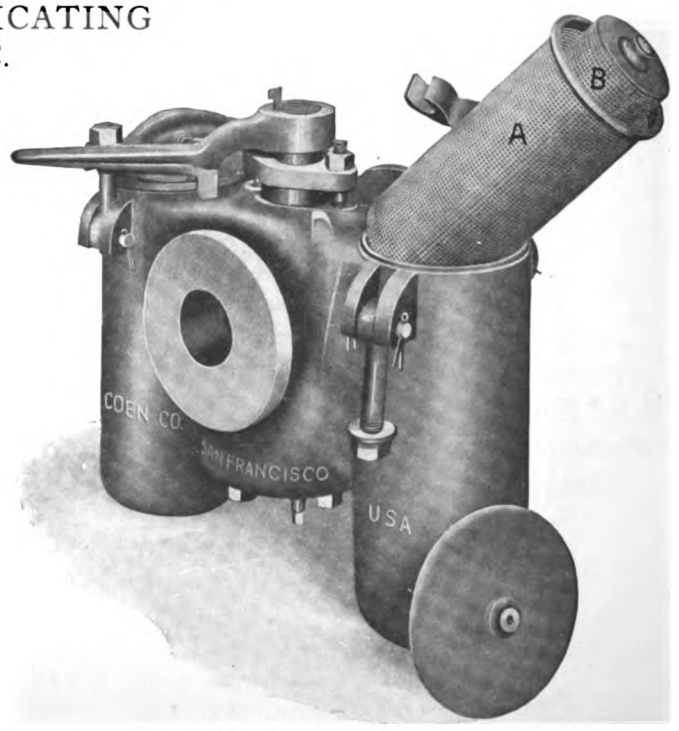

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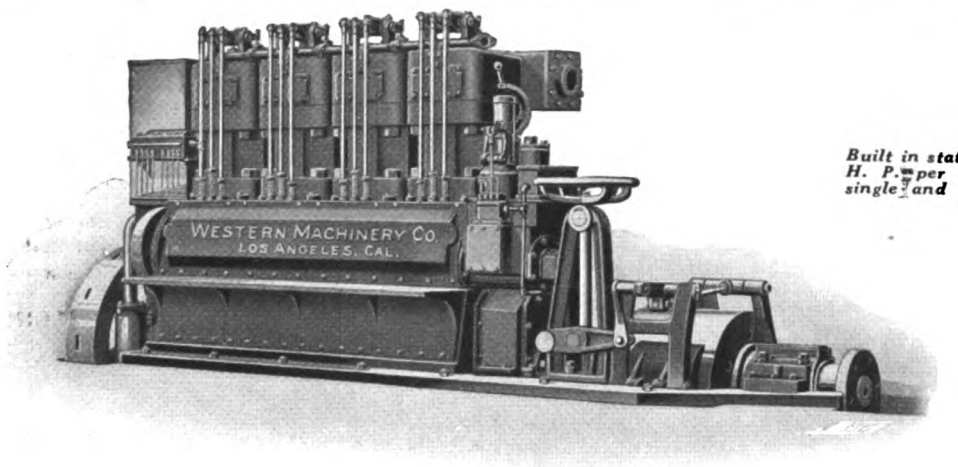
The "Western" Diesel Marine Engine 100 H. P. Four Cylinder Unit



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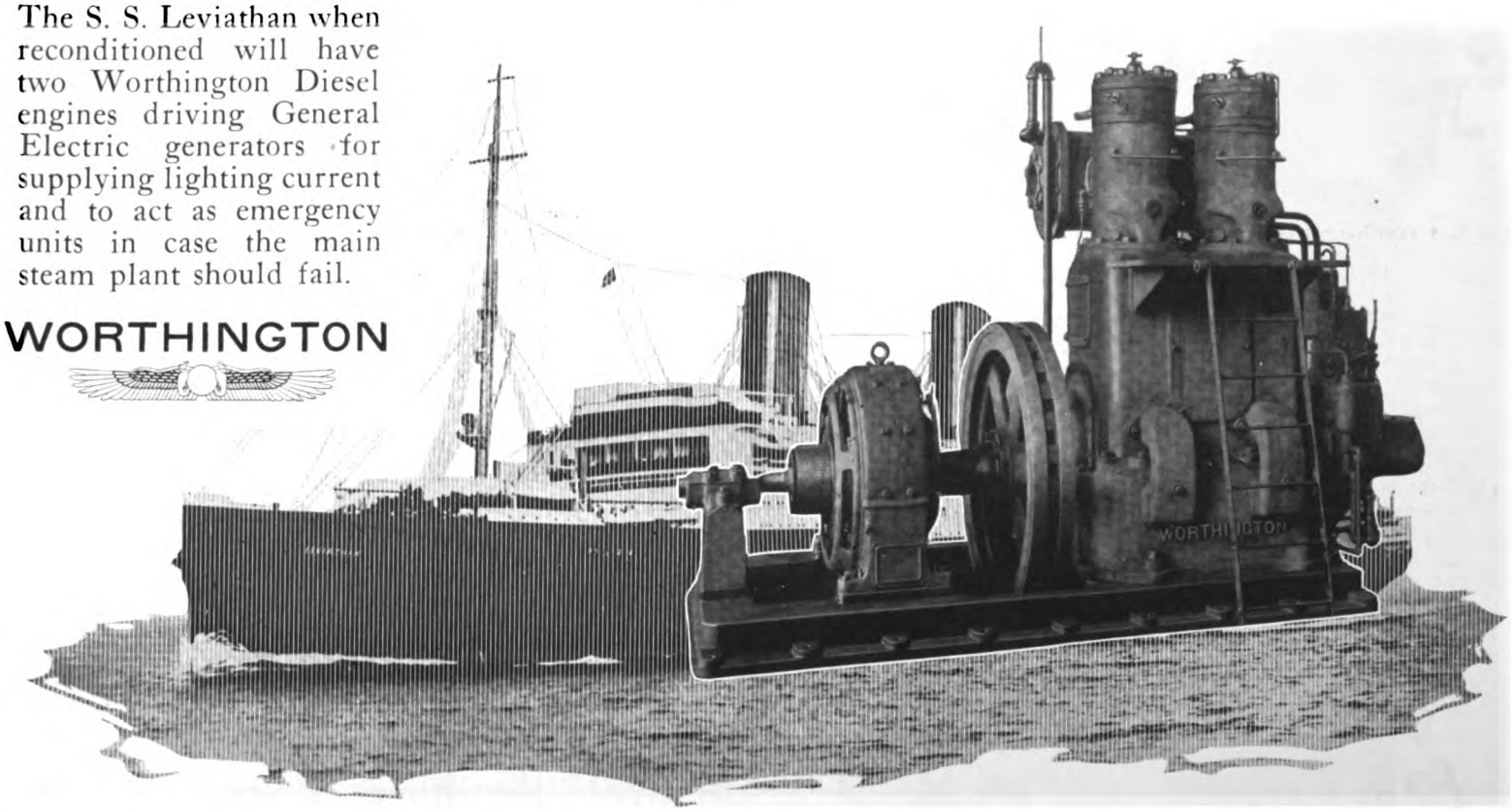

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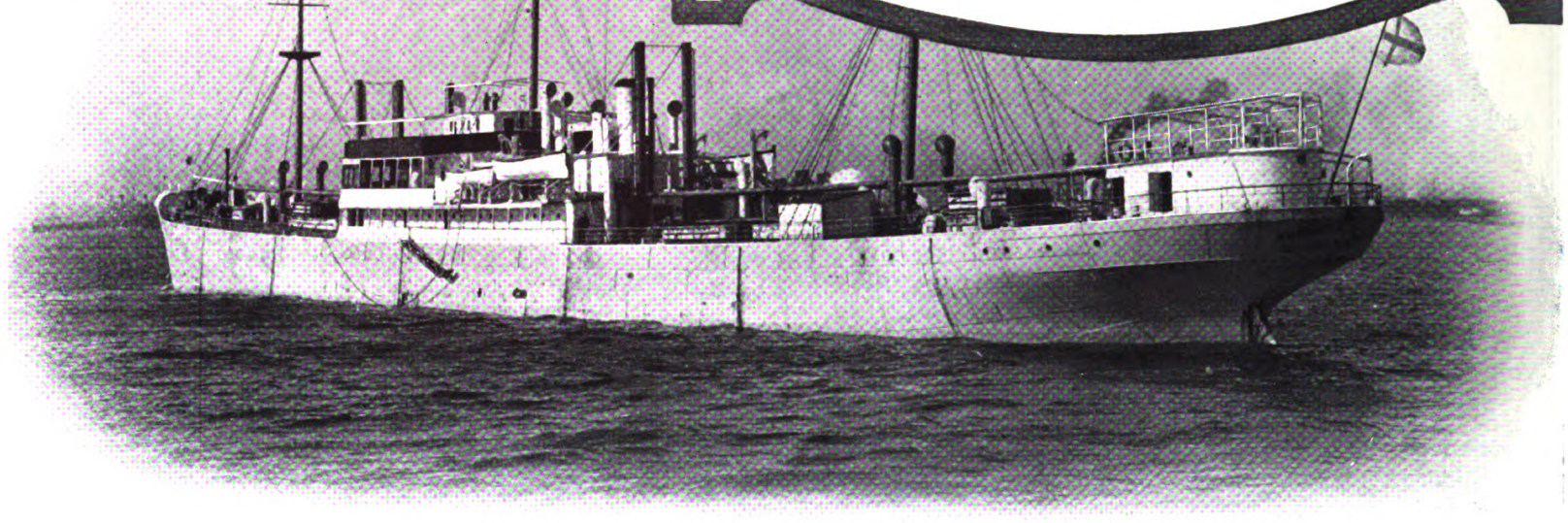

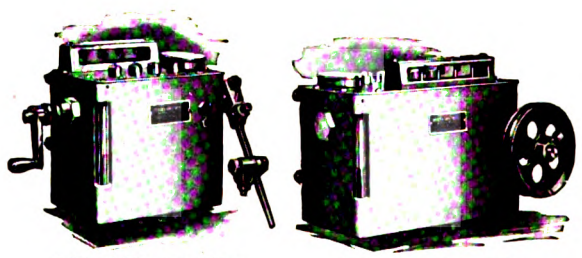

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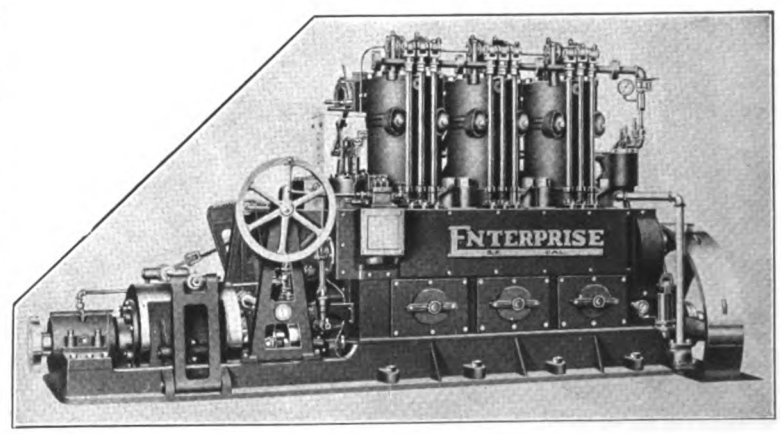

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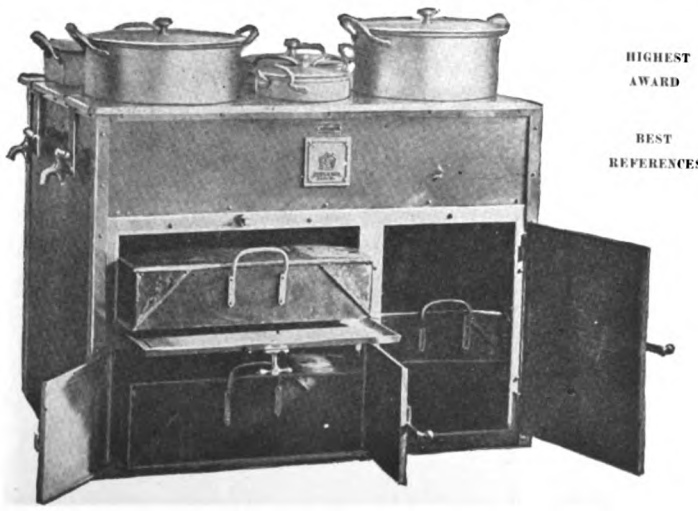

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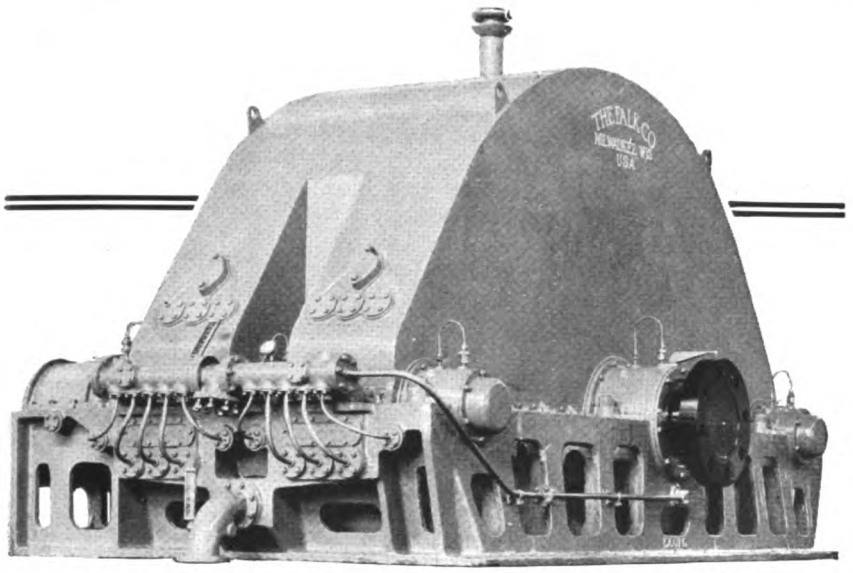

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MARINE OIL ENGINES

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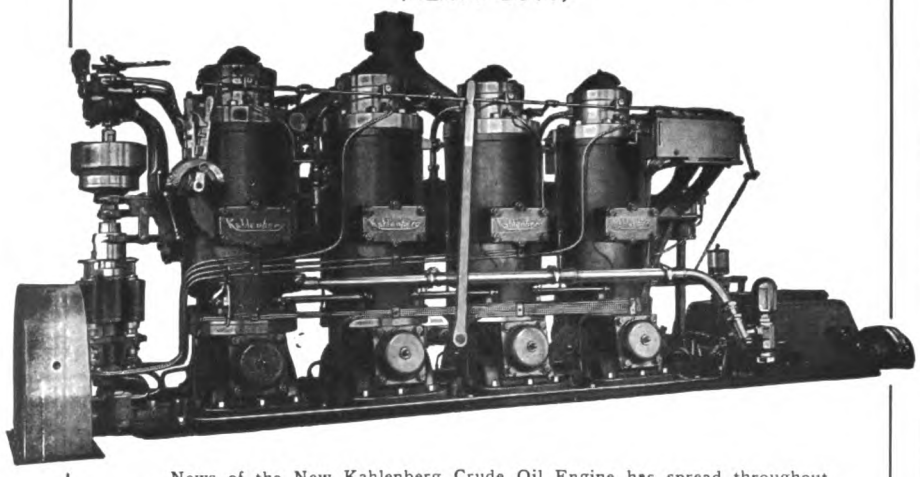

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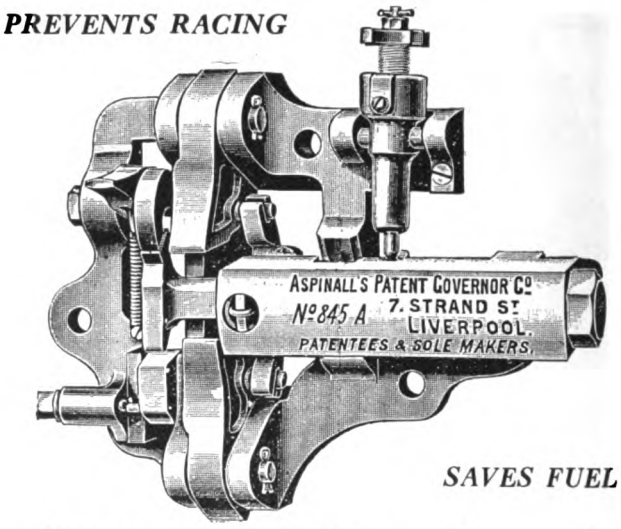

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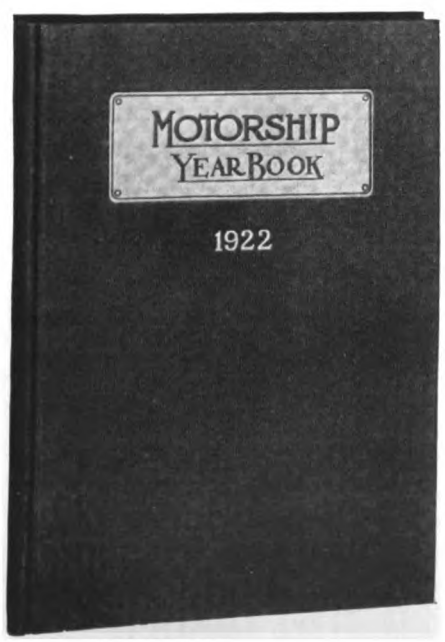

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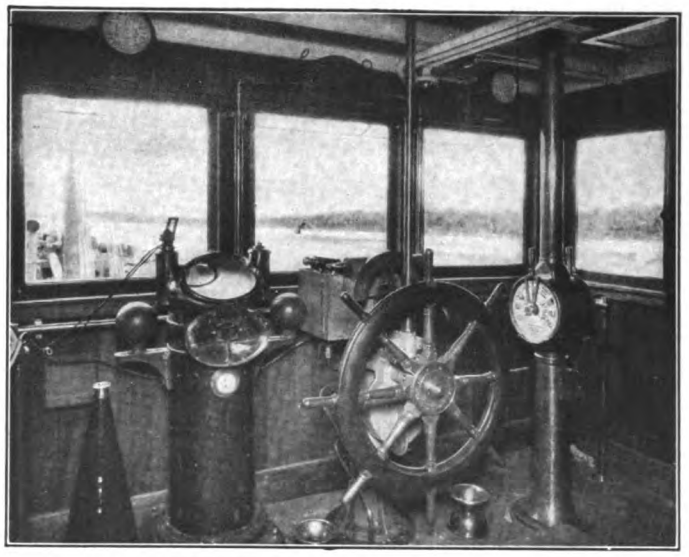

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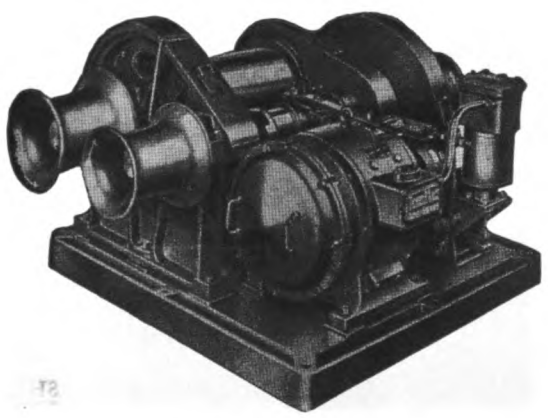

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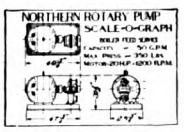

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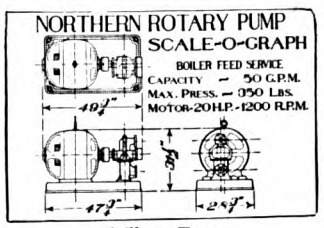

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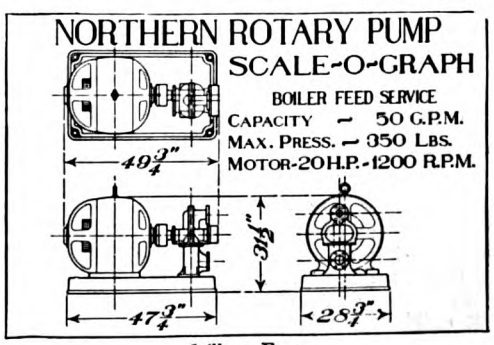

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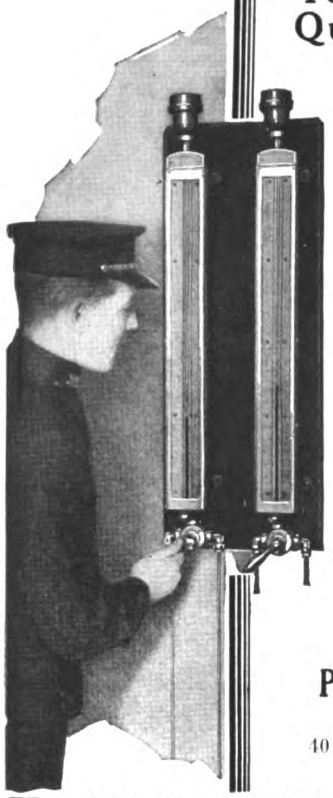

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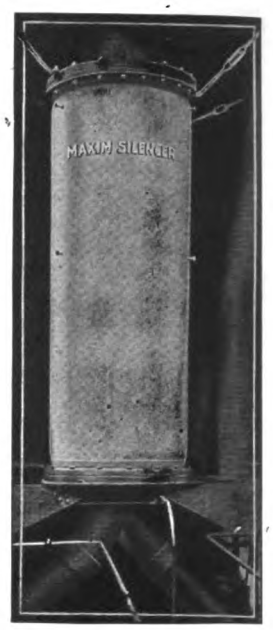

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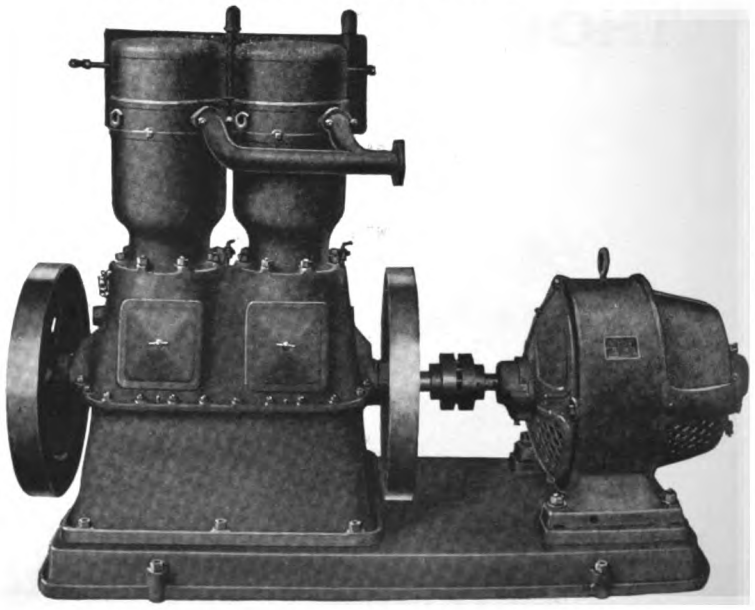

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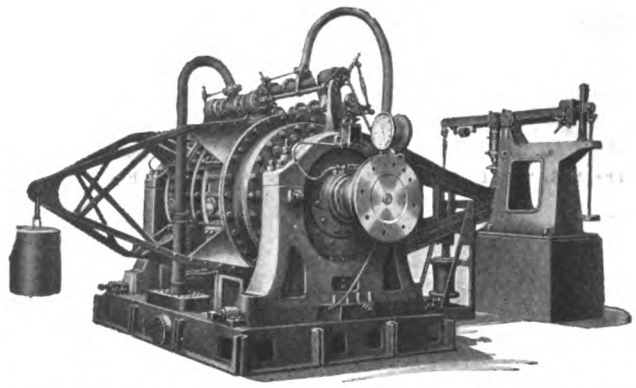

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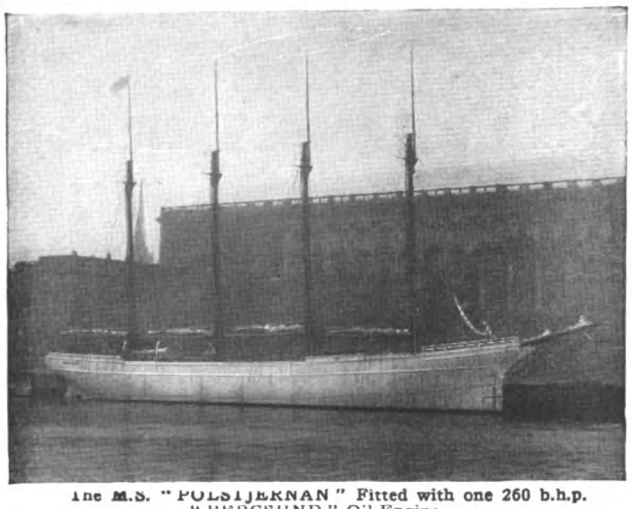

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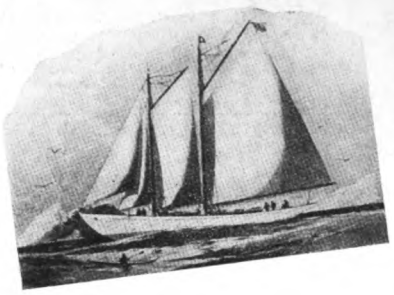
Donald MacMillan and his C~O Engine



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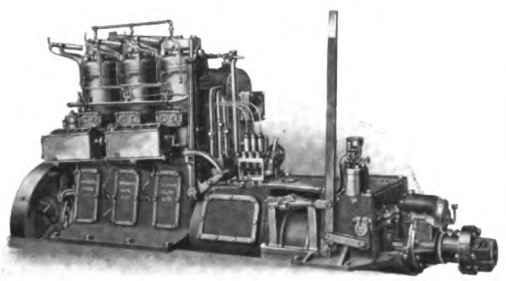

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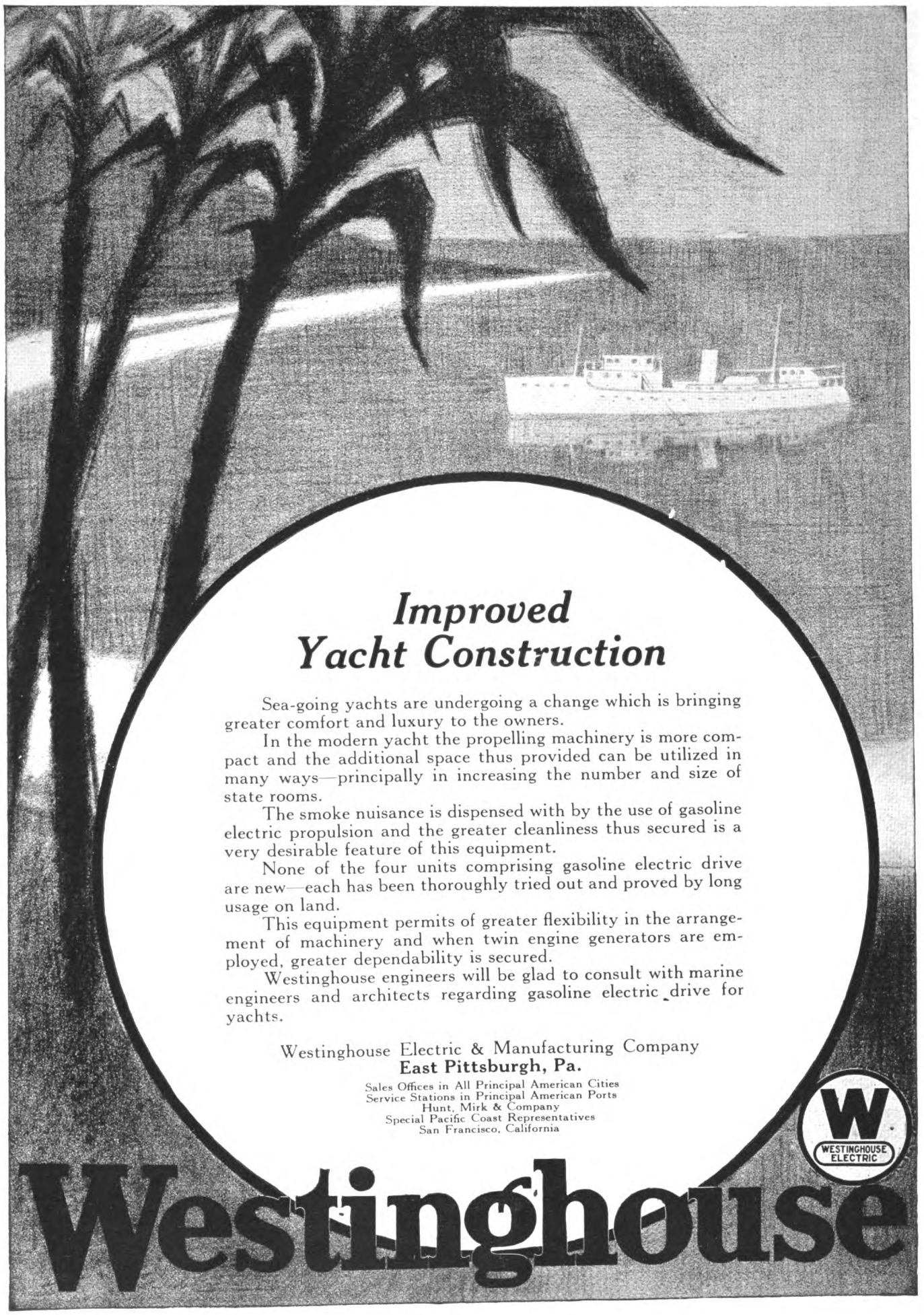

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